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Unit 9: Money and Banking

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Functions of Money

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. 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.

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.

Demand for Money – Transaction Motive

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.

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

$$M^d_T = kt$$

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

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 in the following form

$$\frac{1}{k} \times M^d_T = T$$

Or

$$v \times M^d_T = T$$

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 point of time. The velocity of money, v, however, has a time dimension. It refers to the number of times every unit of stock change hand during a unit period, 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.

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. It can be expressed as

$$M^d_T = kPY$$

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 to its average price level.

Demand for Money – 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. These papers are issued by governments or firms for borrowing money from the public and they are tradable in the market.

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

$$M_s^d = \frac{r_{max} - r}{r - r_{min}}$$

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.

In the diagram, 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 summarized by the following equation

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

The Supply of Money

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 accountholder. Other deposits, e.g. fixed deposits, have a fixed period to maturity and are referred to as time deposits.

Currency notes and coins are 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 gradations 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

Money Creation by the Banking System

The Currency Deposit Ratio: The currency deposit ratio (cdr) is the ratio of money held by the public in currency to that they hold in bank deposits. It reflects people's preference for liquidity. It is a purely behavioral parameter which depends, among other things, on the seasonal pattern of expenditure. For example, cdr increases during the festive season as people convert deposits to cash balance for meeting extra expenditure during such periods.

The Reserve Deposit Ratio: Banks hold a part of the money people keep in their bank deposits as reserve money and loan out the rest to various investment projects. Reserve money consists of two things – vault cash in banks and deposits of commercial banks with RBI. Banks use this reserve to meet the demand for cash by account holders. Reserve deposit ratio (rdr) is the proportion of the total deposits commercial banks keep as reserves. Keeping reserves is costly for banks, as, otherwise, they could lend this balance to interest earning investment projects. However, RBI requires commercial banks to keep reserves to ensure that banks have a safe cushion of assets to draw on when account holders want to be paid. RBI uses various policy instruments to bring forth a healthy rdr in commercial banks. The first instrument is the Cash Reserve Ratio which specifies the fraction of their deposits that banks must keep with RBI. There is another tool called Statutory Liquidity Ratio which requires the banks to maintain a given fraction of their total demand and time deposits in the form of specified liquid assets. Apart from these ratios RBI uses a certain interest rate called the Bank Rate to control the value of RDR. Commercial banks can borrow money from RBI at the bank rate when they run short of reserves. A high bank rate makes such borrowing from RBI costly and, in effect, encourages the commercial banks to maintain a healthy RDR.

Assets – Rs		Liability – Rs	
• Reserves		Deposits	100
– Vault Cash	15		
– Deposits with RBI	5		
• Bank Credit			
– Loans	30		
– Investments	50		
rdr = 0.2			

High Powered Money: The total liability of the monetary authority of the country, RBI, is called the monetary base or high powered money. It consists of currency (notes and coins in circulation with the public and vault cash of commercial banks) and deposits held by the Government of India and commercial banks with RBI. If a member of the public produces a currency note to RBI the latter must pay her value equal to the figure printed on the note. Similarly, the deposits are also refundable by RBI on demand from deposit-holders. These items are claims which the general public, government or banks have on RBI and hence are considered to be the liability of RBI. RBI acquires assets against these liabilities.

The process can be understood easily if we consider a simple stylised example. Suppose RBI purchases gold or dollars worth Rs 5. It pays for the gold or foreign exchange by issuing currency to the seller. The currency in circulation in the economy thus goes up by Rs 5, an item that shows up on the liability side of the balance sheet. The value of the acquired assets, also equal to Rs 5, is entered under the appropriate head on the Assets side. Similarly, RBI acquires debt bonds or securities issued by the government and pays the government by issuing currency in return. It issues loans to commercial banks in a similar fashion2.

We are now ready to explain the mechanism of money creation by the monetary authority, RBI. Suppose RBI wishes to increase the money supply. It will then inject additional high powered money into the economy in the following way. Let us assume that RBI purchases some asset, say, government bonds or gold worth Rs H from the market. It will issue a cheque of Rs H on itself to the seller of the bond. Assume also that the values of cdr and rdr for this economy are 1 and 0.2, respectively. The seller encashes the cheque at her account in Bank A, keeping Rs H/2 in her account and taking Rs H/2 away as cash. Currency held by the public thus goes up by 2 H . Bank A's liability goes up by Rs H/2 because of this increment in deposits.

But its assets also go up by the same amount through the possession of this cheque, which is nothing but a claim of the same amount on RBI. The liability of RBI goes up by Rs H, which is the sum of the claims of Bank A and its client, the seller, worth Rs H/2 and Rs H/2, respectively.

Thus, by definition, high powered money increases by Rs H.

The process does not end here. Bank A will keep Rs 0.2H/2 of the extra deposit as reserve and loan out the rest, i.e. Rs (1–0.2)H/2 = Rs 0.8H/2 to another borrower. The borrower will presumably use this loan on some investment project and spend the money as factor payment. Suppose a worker of that project gets the payment. The worker will then keep Rs 0.8H/4 as cash and put Rs 0.8H/2 in her account in Bank B.

Bank B, in turn, will lend Rs 0.64H/8 . Someone who receives that money will keep 0.64H/8 in cash and put 0.64H/8 in some other Bank C. The process continues ad infinitum.

	Currency	Deposits		Money Supply
Round 1	$\dfrac{H}{2}$	$\dfrac{H}{2}$	(Bank A)	H
Round 2	$\dfrac{0.8H}{4}$	$\dfrac{0.8H}{4}$	(Bank B)	$\dfrac{0.8H}{2}$
Round 3	$\dfrac{0.64H}{8}$	$\dfrac{0.64H}{8}$	(Bank C)	$\dfrac{0.64H}{4}$
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		etc.

Instruments of the Monetary Policy and Reserve Bank of India

Commercial banks create this extra amount of money by giving out a part of their deposits as loans or investment credits. Total amount of deposits held by all commercial banks in the country is much larger than the total size of their reserves. If all the account-holders of all commercial banks in the country want their deposits back at the same time, the banks will not have enough means to satisfy the need of every accountholder and there will be bank failures.

The Reserve Bank of India plays a crucial role here. In case of a crisis like the above it stands by the commercial banks as a guarantor and extends loans to ensure the solvency of the latter. This system of guarantee assures individual account-holders that their banks will be able to pay their money back in case of a crisis and there is no need to panic thus avoiding bank runs.

This role of the monetary authority is known as the lender of last resort. Apart from acting as a banker to the commercial banks, RBI also acts as a banker to the Government of India, and, to the state governments. It is commonly held that the government, sometimes, 'prints money' in case of a budget deficit, i.e., when it cannot meet its expenses (e.g. salaries to the government employees, purchase of defense equipment from a manufacturer of such goods etc.) from the tax revenue it has earned.

The government, however, has no legal authority to issue currency in this fashion. So, it borrows money by selling treasury bills or government securities to RBI, which issues currency to the government in return. The government then pays for its expenses with this money. The money thus ultimately comes into the hands of the general public (in the form of salary or sales proceeds of defense items etc.) and becomes a part of the money supply. Financing of budget deficits by the governments in this fashion is called Deficit Financing through Central Bank Borrowing.

However, the most important role of RBI is as the controller of money supply and credit creation in the economy. RBI is the independent authority for conducting monetary policy in the best interests of the economy – it increases or decreases the supply of high powered money in the economy and creates incentives or disincentives for the commercial banks to give loans or credits to investors. The instruments which RBI uses for conducting monetary policy are as follows:

Open Market Operations: RBI purchases (or sells) government securities to the general public in a bid to increase (or decrease) the stock of high powered money in the economy. Suppose RBI purchases Rs 100 worth government securities from the bond market. It will issue a cheque of Rs 100 on itself to the seller of the bond. The seller will deposit the cheque in her bank, which, in turn, will credit the seller's account with a balance of Rs 100. The bank's deposits go up by Rs 100 which is a liability to the bank. However, its assets also go up by Rs 100 by the possession of this cheque, which is a claim on RBI. The bank will deposit this cheque to RBI which, in turn, will credit the bank's account with RBI with Rs 100. The changes in RBI's balance sheet are shown in Table 3.4. Total liability of RBI, or, by definition, the supply of high powered money in the economy has gone up by Rs 100. If RBI wishes to reduce the supply of high powered money it undertakes an open market sale of government securities of its own holding in just the reverse fashion, thereby reducing the monetary base.

Bank Rate Policy: As mentioned earlier, RBI can affect the reserve deposit ratio of commercial banks by adjusting the value of the bank rate – which is the rate of interest commercial banks have to pay RBI – if they borrow money from it in case of shortage of reserves. A low (or high) bank rate encourages banks to keep smaller (or greater) proportion of their deposits as reserves, since borrowing from RBI is now less (or more) costly than before. As a result banks use a greater (or smaller) proportion of their resources for giving out loans to borrowers or investors, thereby enhancing (or depressing) the multiplier process via assisting (or resisting) secondary money creation. In short, a low (or high) bank rate reduces (or increases) rdr and hence increases (or decreases) the value of the money multiplier, which is $(1 + cdr)/(cdr + rdr)$. Thus, for any given amount of high powered money, H, total money supply goes up.

Varying Reserve Requirements: Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) also work through the rdr-route. A high (or low) value of CRR or SLR helps increase (or decrease) the value of reserve deposit ratio, thus diminishing (or increasing) the value of the money multiplier and money supply in the economy in a similar fashion.

Sterilisation by RBI: RBI often uses its instruments of money creation for stabilising the stock of money in the economy from external shocks. Suppose due to future growth prospects in India investors from across the world increase their investments in Indian bonds which under such circumstances, are likely to yield a high rate of return. They will buy these bonds with foreign currency. Since one cannot purchase goods in the domestic market with foreign currency, a person who sells these bonds to foreign investors will exchange her foreign currency holding into rupee at a commercial bank. The bank, in turn, will submit this foreign currency to RBI and its deposits with RBI will be credited with equivalent sum of money.

The commercial bank's total reserves and deposits remain unchanged (it has purchased the foreign currency from the seller using its vault cash, which, therefore, goes down; but the bank's deposit with RBI goes up by an equivalent amount – leaving its total reserves unchanged). There will, however, be increments in the assets and liabilities on the RBI balance sheet. RBI's foreign exchange holding goes up. On the other hand, the deposits of commercial banks with RBI also increase by an equal amount. But that means an increase in the stock of high powered money – which, by definition, is equal to the total liability of RBI. With money multiplier in operation, this, in turn, will result in increased money supply in the economy.