Economics of Banking and Finance Markets
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Lecture - 39
Central Banking - II

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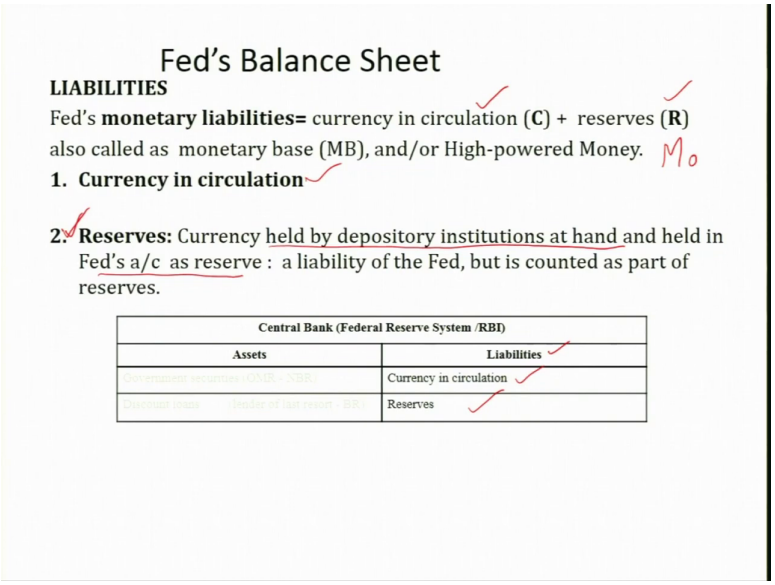

Welcome to this session, in this session we are going to discuss the liability part of Fed's Balance Sheet, and subsequently we are going to see how changes in Fed's balance sheet is, when Central bank changes the components of their assets and liabilities, is going to affect the money supply.

Coming to the liabilities part; two components of the liabilities of the Fed are, one is currency in circulation and 2nd one is reserves. This is also called as monetary base and called as high-powered money, and the definition that we have given earlier was the M0 money.

The monetary liabilities are equal to currency in circulation and reserves. So, let us discuss this one-by-one. Currency in circulation means, the amount of currency in the hands of the public; that is the amount of currency in the hands of the public that is called currency in circulation. So, please note that currency held by depository institution is also a liability of the Fed and it is counted as part of the reserve, but it is not part of the currency in circulations.

That means, the currency held by the banking system is not included in currency in circulation, but it's a liability, we are going to include it in reserves. And, coming to the 2nd component, that is reserves; a reserve means currency held by depository institutions at hand and held in Fed's account as reserves.

So, it's a liability of the Fed, but it's counted as part of our reserves. So, to summarize this one, in the Fed's balance sheet, what we can see here is that the liabilities, one is currency in circulation; then 2nd one is reserves; that means, currency held by depository institutions at hand (vault), as well as held in Fed's accounts both are considered as a reserve.

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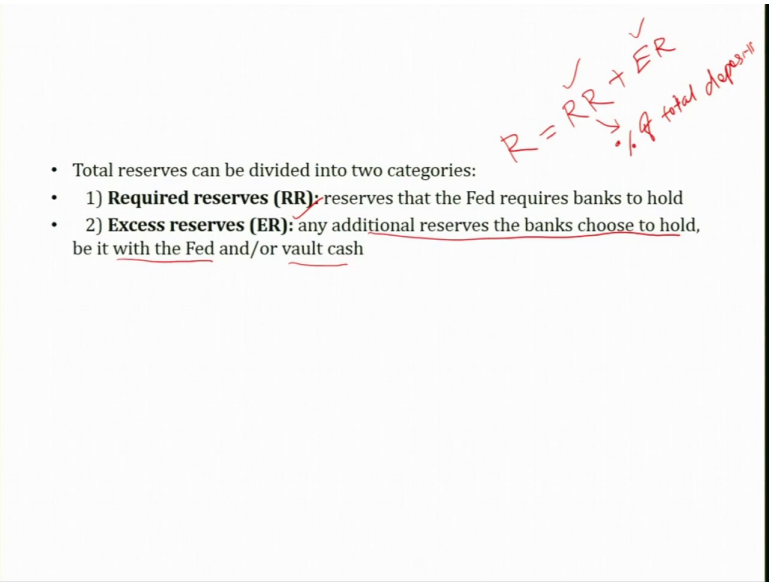

We can divide the total reserves it into two categories; one is called as required reserve and the 2nd one is called as excess reserve. So, coming to the required reserve; a required reserve means a fraction of the total demand and time deposits must be kept with the Central banking system, with the Central bank as required reserve. This is mandatory. For example, in India, you know that is approximately 4 percentage, it changes often when Central bank announce monetary policy.

So, that means, the here the required reserve means, a certain fraction of the total deposit kept with the Central banking system, that is the required reserve. And in addition to that, banking system also keep additional money in their reserve bank account; that means, any additional reserve the bank chooses to hold, be it with the Fed account or be it with their own vault (vault cash), this is called excess reserve.

So, totally we are going to make the total reserve is equal to required reserve and excess reserve, both are considered as reserves in our definition.

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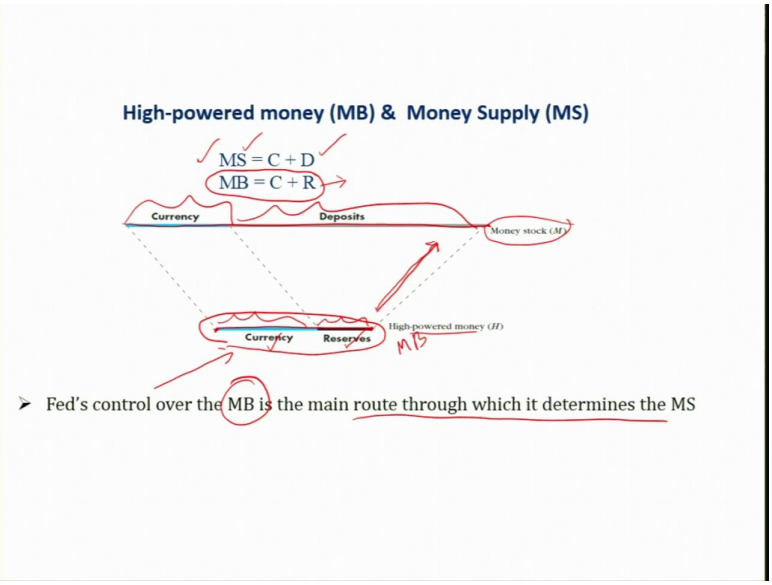

So, look at this figure, what we can see here is that the bottom part you can see that at any given period, this part, this much is the currency in circulation currency and the remaining, this much is the reserves; that means, reserve means including required reserve and excess reserve, and both are part of high-powered money.

So, the high-powered money means, the currency in circulation and reserve that the required reserve and excess resource, we are going to call it as the monetary base and going to call it as the high-powered money. This is the high-powered money.

So, this is the money supply; that means, currency in circulation, the amount is same, but the deposit we can see that it consists of a larger component. So, based on this monetary base, we are we are going to say that a Central bank can control the monetary base in fact. So, the Fed's control over the monetary base is the main route through which it determines the money supply.

So, you can see that this is a smaller component, this is the based on this, the Fed is able to increase the money supply to this much. So, this is the main route. So, what we are going to focus here is that, mainly on the monetary base, when we discuss the function of Central bank in affecting the money supply.

So, mainly through the monetary base, that is the main route through which it determines the money supply.

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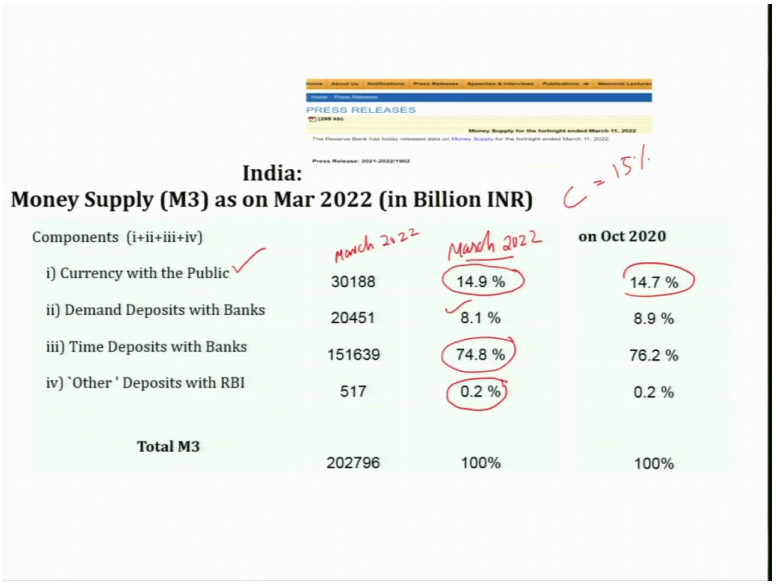

So, let us now focus on this monitory base, this part. And, also before moving further, let me also show you the money supply in India, what are the components included there. So, we can say that a currency with the public, is the that 14.7 percentage, this one in March 2022.

So, you can see that this is the currency with the public, we can see that the C component consist of approximately 15 percentage. So, the remaining 85 percentage; that means, demand deposits with the bank consist of 8.1 percentage. Time deposit that also part of money supply definition, it consists of approximately 75 percentage. And the 0.2 percent, this is called other deposits by with the RBI, it is mainly done by Prime minister, ex-prime minister, governors etcetera.

And the government also deposit money with the Central bank, this is called 'other deposit with the RBI'. So, you can see from here itself, currency constitute only 15 percentage of the total money supply, all the remaining parts, the deposits, that is demand deposit, time deposits and other deposits with the RBI constitute larger share in money supply.

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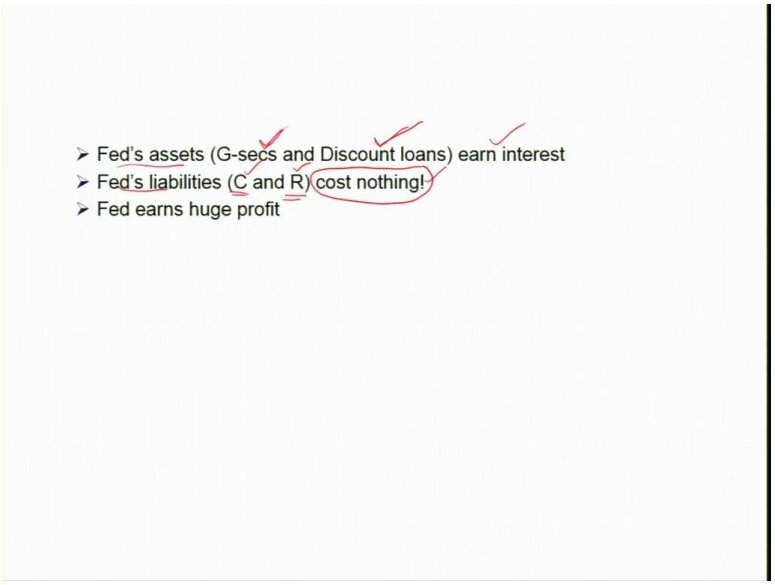

So, from the balance sheet, what we can see that in the Fed assets; that means, government securities and discount loans, you can see that both earn interest income, right. From the government securities which is being held by the Central bank, you know that periodically they will be getting interest income. When they lend to the commercial banking system, there also the central bank earns interest income.

Fed's liabilities are mainly currency in circulation, and the reserves. So, you can see that practically, it cost nothing; though, there are currencies minting cost; it involves some currency distribution cost, all these are very nominal cost. And maintaining reserve also involves some nominal cost.

But in overall, as compared to the income that they are earning from these assets, it cost nothing, mini-meager amount. So, in that way, Central bank can earn huge profit from their operations.

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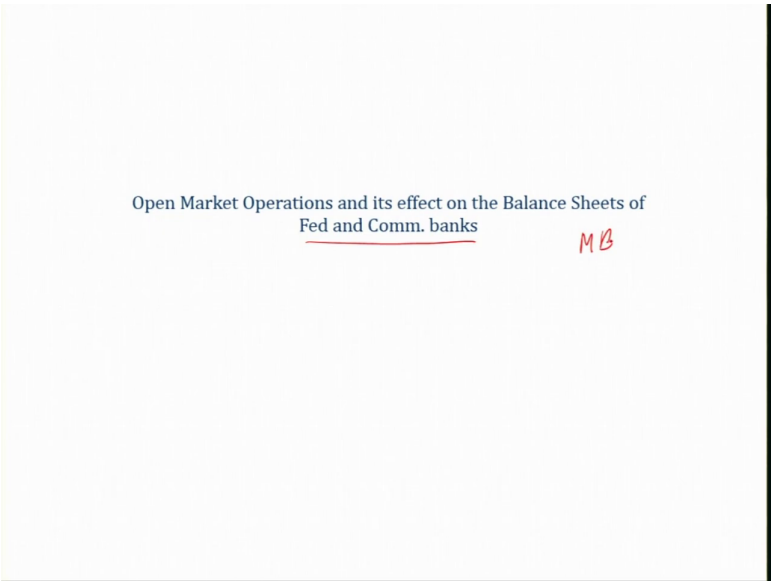

You are now familiar with what are the key components of a Central bank's asset side and the liability side. Let us now see when Central bank using open market operations, that is buying and selling government securities, how does it affect the balance sheet of the commercial banks?

And then, what are the impact of open market operations on the monetary base and the money supply? So, in this session, we will mainly focus on the monetary base, to see how does open market operation affect the monetary base.

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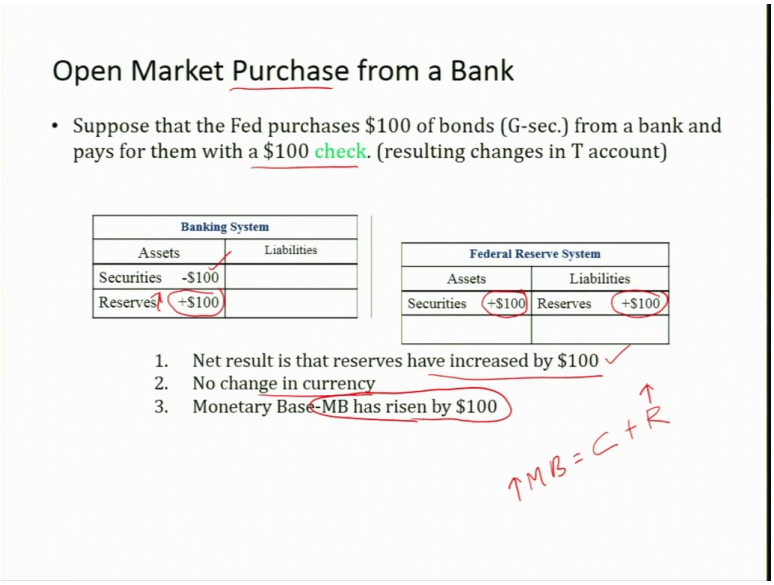

So, let us start for example, suppose that Fed purchases 100 dollars of bonds, that is government securities from a bank and pays for them with 100 dollars check. So, result, what are the resulting changes in the T account.

So, we can see that, in the banking system, we can see that the amount of their securities has declined by 100 dollars, then you know that when this one is transferred to the Fed, the Fed will be crediting in the accounts of the banking system with 100 dollars.

Immediately, there is an increase in the reserve of the banking system by 100 dollars. How about the federal reserve system? And you can see that federal reserve system's assets have increased by 100 dollars; but when they are getting this asset, they must credit 100 dollars in the account of the bank who had sold this security to the Fed; that means, the liability of the federal reserve system is increased by 100 dollars.

So, let us see the net result here is that the reserves have increased by 100 dollars; that means, through an open market operation, that is through an open market purchase from a bank, the net result that in the banking systems reserves have increased by 100 dollars. And, about the currency in circulation? We can see that, there is no change in currency in circulation immediately after that.

So, what is monetary base? Monetary base, we already seen the monetary base means C plus reserve with the banking system. So, in the monetary base, we see that there is no change in currency in circulation, but the reserve has increased.

So, you can see that, because of this open market purchase, the monetary base has increased by 100 dollars, that is the first impact of Open market purchase in the banking system. The reserve of the banking system has risen by 100 dollars.

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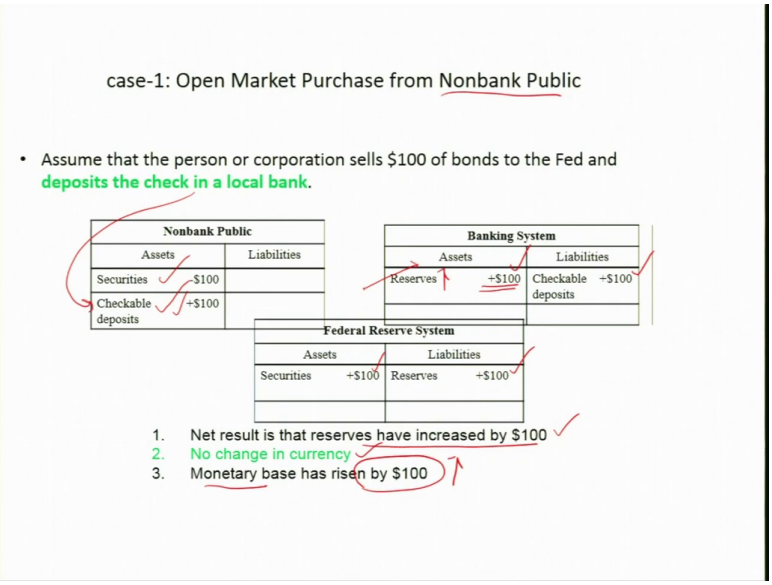

Let us discuss two cases of open market purchase, 1 is open market purchase from nonbank public that is the public. Assume that a person or a corporation sells 100 dollars of bonds to the Fed and deposit the check in a local bank.

So, how does it affect the nonbank public balance sheet? Suppose the corporation, you can see that their securities have declined by 100 dollars, and checkable deposits increased by 100 dollar; that means, when the Fed issue a check and this check has been deposited in a bank, then you know that a bank will be crediting this amount of 100 dollar immediately in the account of the depositor; that means, in the form of a checkable deposit.

That means, nonbank public checkable deposit has increased by 100 dollars. Then, about the banking system and you can see that immediately when the public or the corporation deposit this money in the banking system, this check will be presented to the Federal resource system.

So, Central bank will be crediting these 100 dollars in the account of this banking system, then you can see that, immediately, this crediting means nothing but an increase in the reserve, the reserve of the banking system increased by 100 dollars. At the same time, liabilities you know that this amount, this bank already credited in the account of as checkable deposit in the account of the depositor. So, that is, checkable deposit also increases.

So, in the banking system, assets increased by 100 dollars and liability increased by 100 dollars. What about the federal reserve system? So, you can see that federal reserve system's security increases, that assets increased by 100 dollar and the liability also increased by 100 dollars.

So, what is the net outcome you can see that the net result here is that reserves have increased by 100 dollars. But no changes in currency here and again, what we have seen in the previous discussion, like that, the monetary base has increased by 100 dollars. Later, we are going to discuss the monetary base is going to play a crucial role in determining the money supply.

Monetary base is the main tool or route through which a Central bank can influence money supply in an economy.

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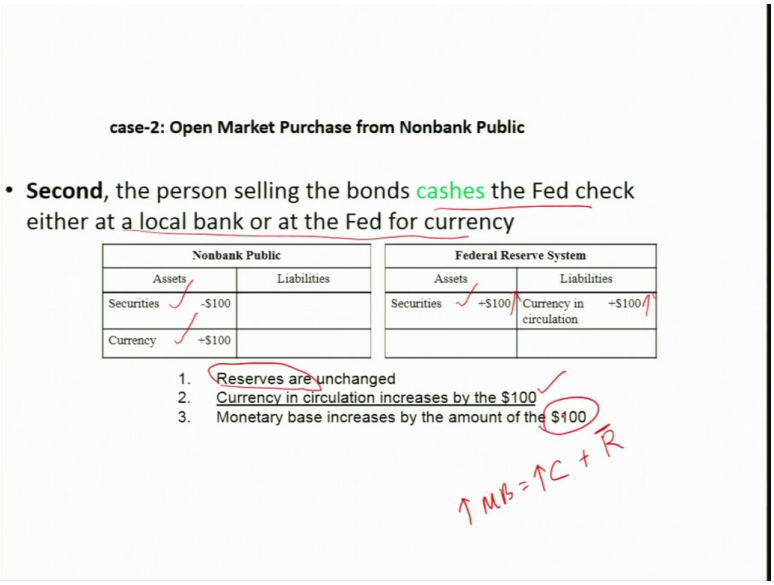

Let us see another case, case 2, again, open market purchase from non-general public. But here the person selling the bonds or the corporation selling the bonds, cashes the Fed check either at a local bank or at the Fed for currency, immediately. They are not keeping these proceeds from the selling of this bond in the form of deposit, instead they just cash it out and you can just see that nonbank public, the securities have declined by 100 dollar and currency has increased by 100 dollars.

And, what about the federal reserve system? We can see that securities how increase; that means, asset has increased, at the same time liabilities also increased. Assets and liabilities

both have increased by 100 dollars here. We can see that there is no change in the reserve; because it is not going through the banking system, they are not keeping it with there at all.

So, we can see that there are no reserves. Reserves are unchanged because the seller of this bond immediately cashed it out. They are not keeping it as a checkable deposit with the banking system. So, currency in circulation has increased by 100 dollar and the monetary base, C plus R, the R remaining constant, but currency in circulation has increased, thereby the monetary base also increased by 100 dollars.

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The summary here is that in both processes, be it whether person selling the bond and deposit the check in a bank or person selling the bond to the Fed cashes the Fed check either at a local bank or Fed for a currency, in both cases what we are going to see that MB that is C plus R, in one process 1st process we can see a R has increased. In 2nd case we can see currency has increased.

In both processes, either it does not matter, but because the monetary base increase in the same amount. Does not matter whether they are depositing in a bank or cashes the proceeds. So, net outcome is that monetary base increases.

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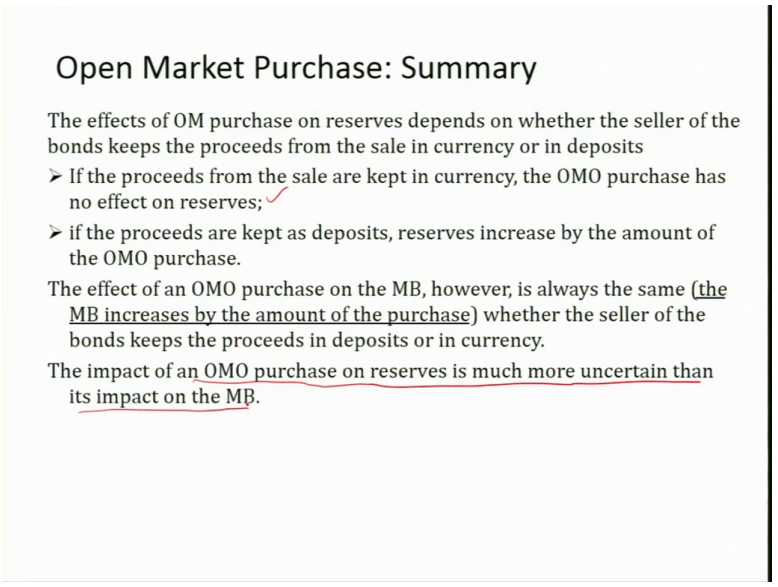

So, this is the summary, we can do that the open market purchase, the effects of open market purchase on reserves depends on whether the seller of the bonds keep the proceeds from the sale of sale in currency or in deposits. If the proceeds from the sale are kept in currency, open market operation purchase has no effect on reserve, that is one point. And, if the proceeds are kept as deposits, then the resource increased by the amount of the open market purchase.

So, the effect of open market operation purchase on the MB; however, it's always the same; that means, MB increases by the amount of the purchase, whether the seller of the bonds keep the proceeds in deposits or in currency.

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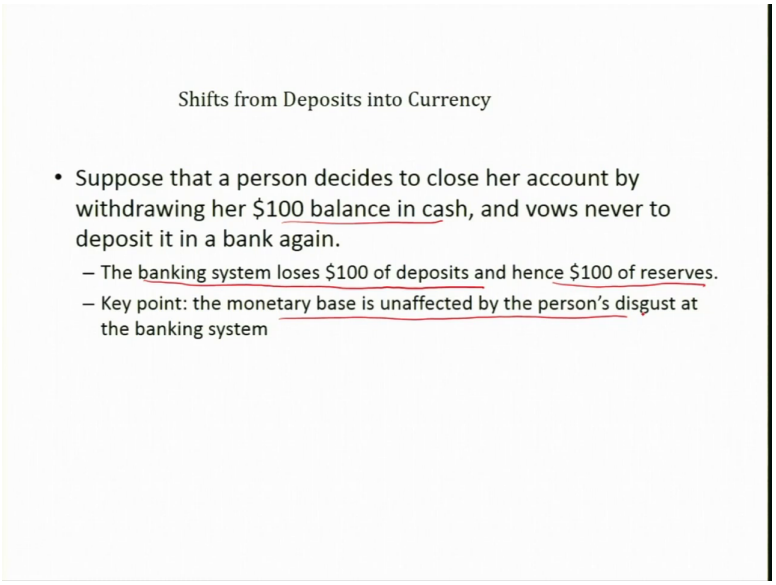

So, now let us see, shifts from deposits into currency. Suppose that a person decides to close her account, her, or his account by withdrawing his or her 100 balances in cash and wow never to deposit it in a bank again. In this case, you can see that banking system loses 100 dollar of deposits and hence 100 dollars of reserves as well. So, the main point here is that, even if there is a shift from deposits into currency, the monetary base is unaffected by persons' disgust at the banking system.

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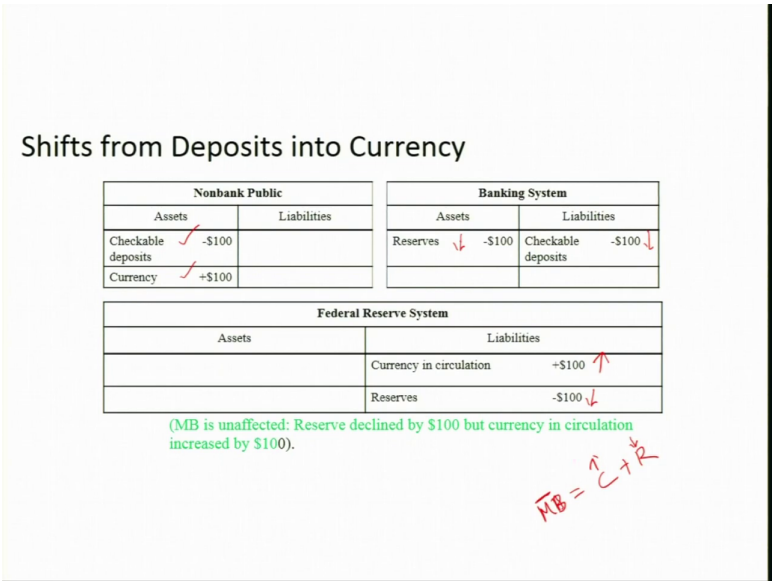

So, shift from deposit into currency, let us see how it affects monetary base. Nonbank public's checkable deposits decline: that means, currency in circulation increases, we can see that deposit component declines and C component that the currency component increases.

In the banking system, what you can see that, there is a decline in the reserve, as well as a decline in the checkable deposits.

So, in this case also, again our MB definition is C plus R. So, we can see that, though reserves have declined, but C has increased. So, the monetary base remaining unaffected. So, the reserve declined by 100 dollars, but currency in circulation increased by 100 dollars here. So, in summary, we can say that monetary base is unaffected.

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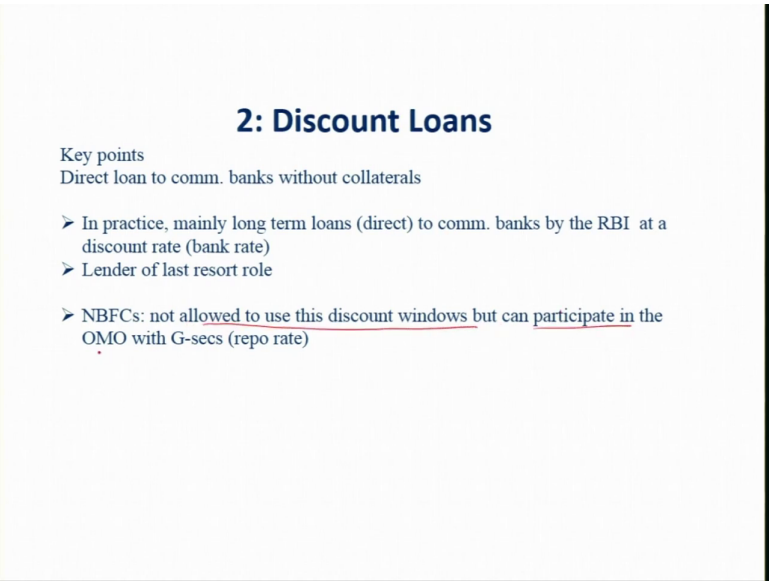

The second one is discounting of loans by the Central bank. So, what is mean by discounting of loans? It's a borrowing window, the discounting window, that is direct loan to commercial banks without collaterals by central bank.

In practice, it is considered as long-term loans to commercial banks by the RBI at a discount rate. So, this is mainly done as a lender of last resort role. And, coming to nonbanking financial institution, they are not allowed to use this discount window, but can participate in the open market operation with government securities.

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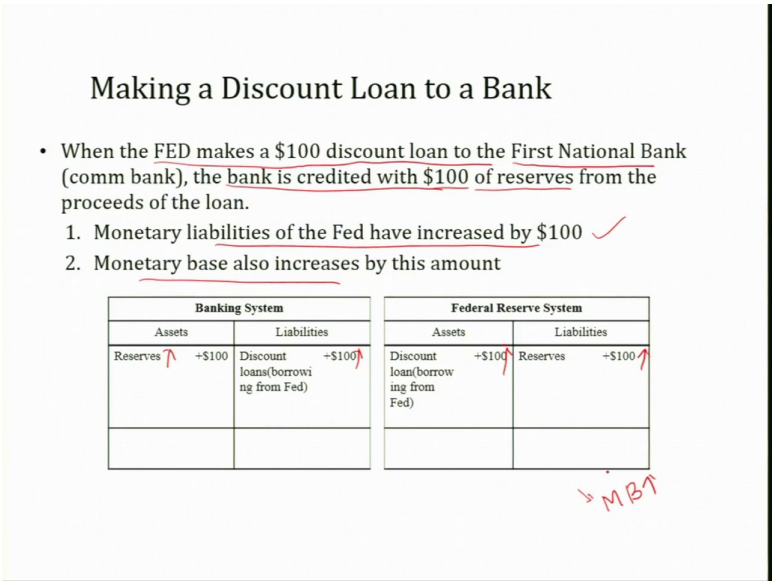

So, let us now discuss how making a discount loan to a bank, affect the monetary base. So, here we are going to discuss how making a discount loan may affect the T account of banking system and federal reserve system and its subsequent impact on the monetary base. So, when the Fed makes a 100-dollar discount loan, to one commercial bank, let us call it as First National Bank, a name to a commercial bank.

How does it affect the balance sheet? So, you know that the bank is credited with 100 dollars of reserves from the proceeds of the loan. So; that means, putting in another words, when the federal reserve system or the Central bank makes a loan to the commercial bank, the proceeds will be immediately credited with the commercial bank in the form of reserve; that means, in the banking system you can see that, the reserve will be increased by 100 dollars, that is, the asset of the banking system increased by 100 dollars.

But the liability also increases; that means, a discount of loan, because its borrowing from Fed also increases. You can see that the monetary liabilities of the federal reserve system now increased by 100 dollars in the form of reserves. And the asset also increased because it has given a loan of 100 dollars to the banking system.

So, here, we can see that the monetary base, when a Central bank give discount loan to commercial bank, the immediate impact is that the monetary base increases; that means, increased by 100 dollars.

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So, this is the one effect. As like open market operation when a Central bank is giving a loan through the discount window, then we can see that the monetary base is increasing.

So, this is the 2nd tool, that is discount loan through which a Central bank can affect the monetary base. What if the commercial bank repays a discount loan from the Fed? If the bank pays back of the loan from the Fed, thereby reducing is borrowing from the Fed by 100, the net effect is that there is a reduction in the monetary base. There is a reduction in the reserves, thus, the asset also declines.

To summarize, these are the two tools that we have discussed. The one is open market operations and another one is discount loans.

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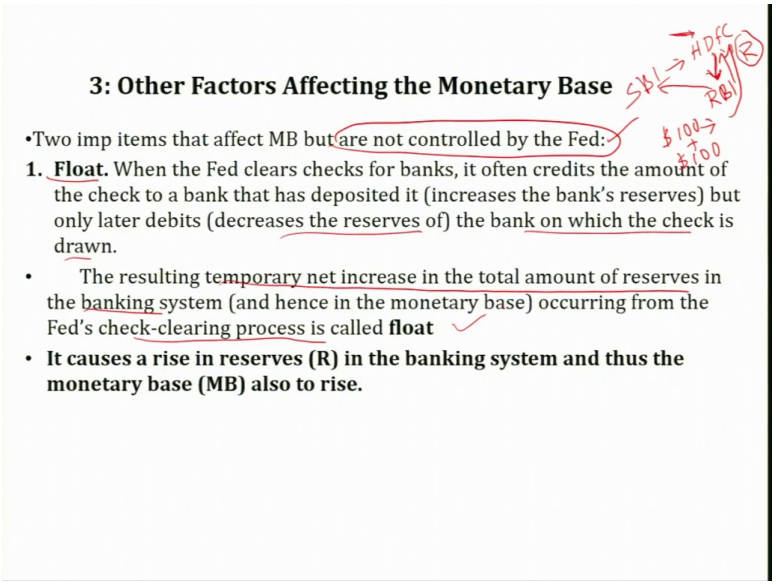

Then the 3rd part is 'other factors affecting the monetary base'. There are mainly two important items that affect monetary base, but they are not controlled by the Fed. So, importantly recall that, Central bank or the federal reserve can control open market operations and discount window, but the other items are not in the control of the Fed.

One is called float; float means when the Fed clears checks for banks. It often credits the amount of the check to a bank that has deposited it. It increases the banks reserves, but only later debits it; that means, decreases the reserve of the bank on which the check is drawn. Suppose, for example, you have an account with the State Bank of India, and you write a check to another person who is having an account with another bank.

For example, you are having an account in the SBI, and you write a check, and you hand it over to a person or a company who is having account in another bank called HDFC, then the proceed, how this transaction will be settled, the person who is getting this check will immediately depositing this one with the HDFC and HDFC will be submitting it into the RBI.

So, when the person who gets this check and deposit with the HDFC bank, immediately this much money will be credited into the account of this person who is depositing this cheque; that means, for example, this one is 100 dollars, this one will be immediately credited to the account holder of HDFC. And immediately you can see that it would not be debited in the SBI account; that means, SBI the same amount of money will be there.

So, it will take some time, maybe a couple of minutes when they deposited with the RBI. And RBI will be deducting from SBI. It may take some couple of minutes or may be hours, that means, until then, this money it is credited into the account of who deposited this check with the HDFC and it also you can see that this is yet to be deducted, that 100 dollar is yet to be deducted from the account of SBI.

So, this amount is called float, resulting temporary net increase in the total amount of reserves in the banking system.

So, this is occurring from the Fed's check clearing process, this is called floating. So, it causes a temporary rise in the reserves in the banking system and thus the monetary base also rises.

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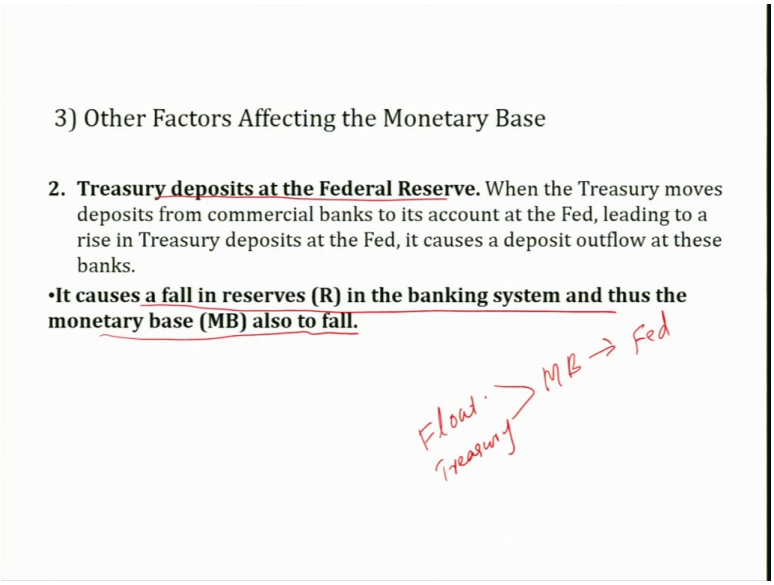

And 2nd one is treasury deposits at the Federal reserve. When the treasury moves its account from commercial banks to the Fed, it also causes a deposit outflow at these banks. So, when there is a deposit outflow, because when the government deposit their money at the federal reserve, when they move their deposit from the commercial bank to the federal reserve system, it causes a fall in the resource in the banking system and thus the monetary base also falls. So, importantly we saw two things, one is float and another one is treasury deposit movement. So, both you can say that there is an impact in monetary base, but this change in monetary base is not at the hands of the Federal reserve system, not with the Central bank.

So, what we have covered here is mainly how the Fed can Fed through the open market operation and discount window influence the monetary base. But there are other factors which also affects monetary base, but not in the control of the federal resource system. Thank you for watching this video and see you in the next session

Thank you.

Keywords: central bank, balance sheet, currency, reserves, open market operation, discount loans, cheques, cash, monetary base, money supply, float, treasury deposit at central bank