Business Analysis for Engineers
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Lecture -41
Fiscal & Monetary Policy

In the last class, we saw the distinction between, the Real and Nominal interest rate, because of the inflation. And, the other Macroeconomic variable, in which a similar distinction, can also arise, is the exchange rate. Which means, there is a Nominal and a Real exchange rate, because of inflation. And, I will try to explain this, using an example.

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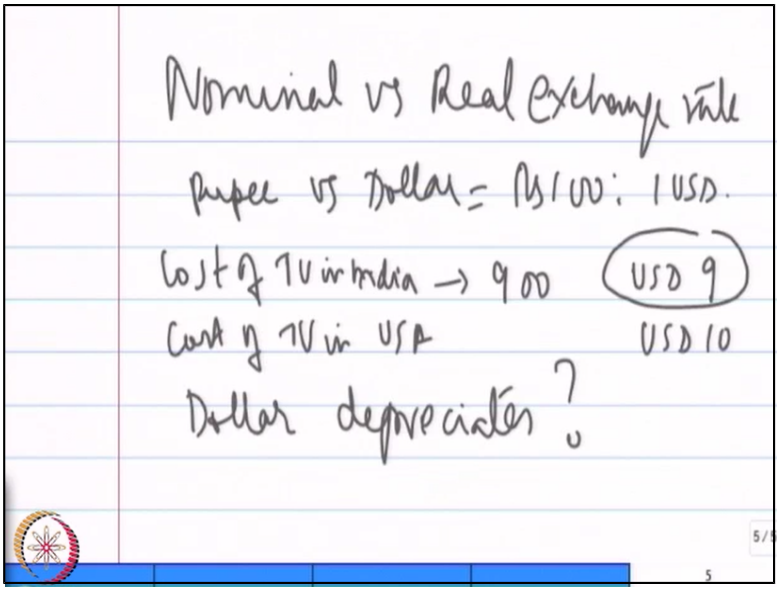

Nominal versus, Real exchange rate. Now, a country's exchange rate strength, as I told before, it is relative to other currencies. And, for the purpose of our example, let us take two countries, India and the US, and try to understand, the Nominal and the Real exchange rate between, the Indian Rupee, and the American Dollar. And, what happens, when the currency depreciates, what happens when a currency appreciates.

I told you before that, if the currency depreciates, it is good news for exporters, bad news for importers, and vice versa. But, is the same argument, valid under circumstances, where there is also an inflation, that is prevailing. Now, let us understand this, by giving you an example. Now, let us say, at the current rate, the Rupee versus Dollar, is Rupees 100 to 1 US Dollar. Right. And,

for the purpose of example, let me just say, I am going to talk about, buying a TV from India, or US.

Now, the cost of TV in India, that says 900 Rupees, or in this exchange rate terms, it is US Dollar 9. And, cost of TV in USA is, US Dollar 10. Right. Assuming, there are no transaction costs. These are all, landed cost. Suppose, I am in the US, what will I do. The cost of getting a TV from India is, 9 Dollars, while getting it from the US is, 10 Dollars. So, as an American, I will import, or export. As an American, it makes sense for me to import, because it is just going to cost me 9 Dollars, if I am getting a TV from India.

And, at this stage, the TV manufacturers in India, there is more incentive to export it. There will be more demand, for exports. Because, let us assume, there will be more Americans, who want to buy TV's from India. Let us say, this is the base case scenario. Now, what happens, if the Dollar depreciates. Dollar depreciates, so what will happen.

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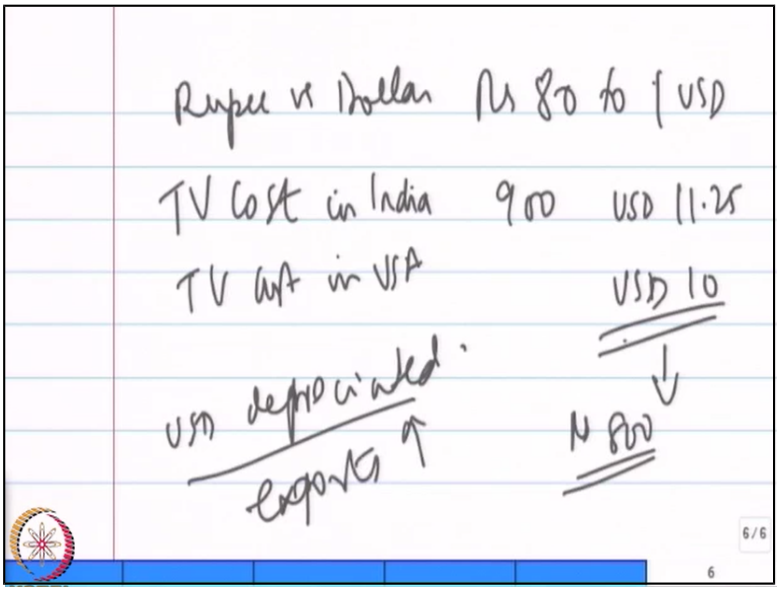

Let us say, the depreciation of the Dollar, has resulted in the situation where, the Rupee versus Dollar is now, Rupees 80 to 1 US Dollar. This is what, I meant by, Dollar getting depreciated, or Rupee gets appreciated. Now, let us see, what happens to the TV cost. The TV cost in India, is the same 900. But, for an American, it is going to be, 11.5 US Dollar. Because, he has to shell out more Dollars for the, same 900 Rupees. And, the TV cost in USA is, US Dollars 10. Right. The

Dollar has depreciated. The Rupee has appreciated. Otherwise, this is the change in the cost structure.

Now, what will Indians do. Now, the Indians need to spend only Rupees 800, to get a TV from US. Because, the cost of US Dollar TV is only 10, for which because, my Rupee has appreciated. This is only 800. So, it makes more sense for me to, import a TV from the US, because the Rupee has appreciated. Or, from an American perspective, because the American Dollar has depreciated, USD has depreciated, exports increase. So, from a base case scenario, we understood that, if a currency depreciates, then it is good news for exporters.

And likewise, it is good news for importers because now, as I said before, it makes more sense, for me to import a TV, from the US. Because, a cost of purchasing a TV is, the outflow of purchasing a TV is 800, in the present context, then Rupees 900, which is the cost of making a TV, domestically. So, I will rather be importing, than buying it from here. Now, a small twist. Let us say, in addition to the currency getting depreciated, there is also inflation in the US. And, let us assume that, there is no inflation in India.

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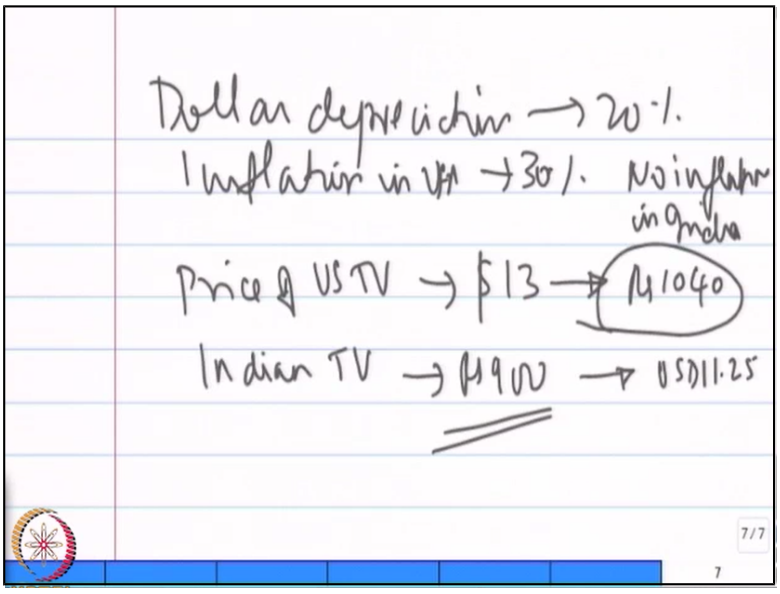

So, you know that, the Dollar depreciation is 20%. From, 100 to 1 Dollar, it is 80 Rupees to 1 Dollar. Let us say, the inflation in the US, is 30%. And, I have said, there is no inflation in India. So, under these circumstances, what will be the price of US TV. It will be Dollars 13. Because, it

is used to cost me, 10 Dollar before. Inflation of the 30%. Which means, the price of a US TV is 13 Dollars, which is equal to Rupees 1040, at the current exchange rate of 80 to 1.

Price of Indian TV, Rupees 900, at a current exchange rate, US Dollars 11.25. Nothing has changed. The Indian Rupee has appreciated, or the US Dollar has depreciated. But, in addition to the depreciation, there is also an inflation of 30%. What will Indians and Americans do now. Because, when there was no inflation, it made more sense for Indians to import the TV, because of the relative incremental strength, that the local currency has got.

But, now in the presence of inflation of 30%, will an Indian, import a TV, from the US. Because, now it is going to cost me 1040. Whereas, an Indian TV is going to cost 900. So, blatantly, it is not safe to assume that, always an exchange rate depreciation, or appreciation, is beneficial to an exporter, or importer, respectively. We also need to understand, how inflation will also cause, a change in the behaviour. Because, what we are interested now, is the Real exchange rate, and not the Nominal exchange rate.

Just as the Real and Nominal interest rate, now the inflation has resulted, in the changed behaviour now. Because, it is the Real exchange rate, that actually counts, and not the Nominal exchange rate. As a result of which, we see now, even when there is a depreciation, in the US Dollar, or an appreciation, in the Indian Rupee, the incentive to import, is entirely missing. Still, I would prefer, a domestic purchase, then importing it. Because, the inflation has eroded, the benefit of the Rupee appreciation.

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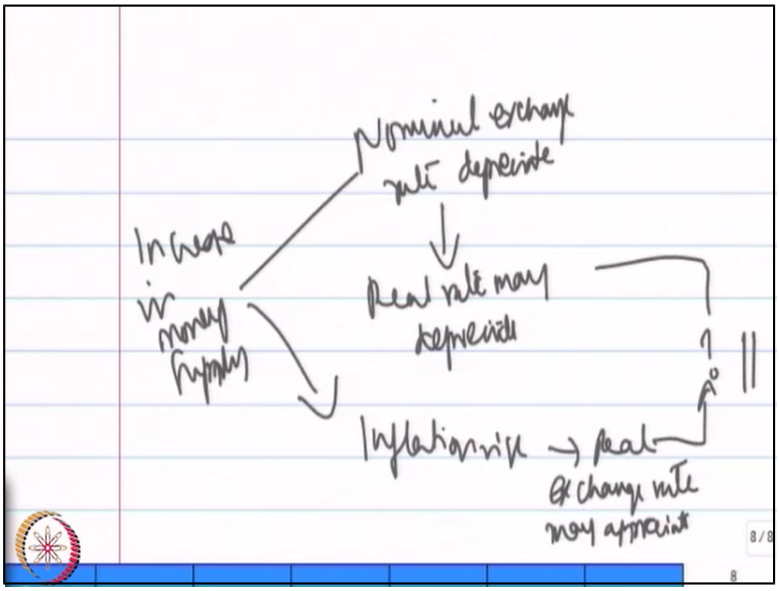

So, the money growth inflation in exchange rates, let us say, as I said before, the increase in money supply will cause, currency to depreciate. So, I am talking about, the Nominal rates. So, the Nominal exchange rate, will depreciate. In case, money supply will cause, inflation to rise. In this case, we found that, if the inflation rises, the Real exchange rate may appreciate. Real rate may also depreciate, if the Nominal exchange rate depreciates. But actually, the extent of inflation, decides the balancing factor.

Just as we saw, the same type of behaviour, in the interest rate, if the inflation rate differential. In this case, if it is less, then the Nominal rate of depreciation of the exchange rate, then the Real exchange rate will depreciate. So, ultimately boils down, to the extent to which, there is a change in inflation. So, the inflation rate differential, the extent to which, there is inflation, will influence the behaviour of the Real exchange rate

And, it is the Real exchange rate, that actually counts. Because, inflation may at times, erode the benefits of a local currency appreciation. So, this is one thing, that we need to understand. Just as inflation has its effect on, interest rate, it also has an effect on, exchange rate. So, what we have seen so far, is the understanding of money, as a fuel for economic growth. And, how money influences, the interest rate, exchange rate, and inflation.

And, how interest rate and exchange rate, the Real and Nominal rate, of interest rate and

exchange rate, can be distinctly understood, based on the inflationary trends. And, how, when the supply of money increases, the interest rate falls, the exchange rate depreciates, and the price level increases, and vice versa. So, we need to understand this, very key relationship between, interest rates, exchange rate, and inflation, with money.

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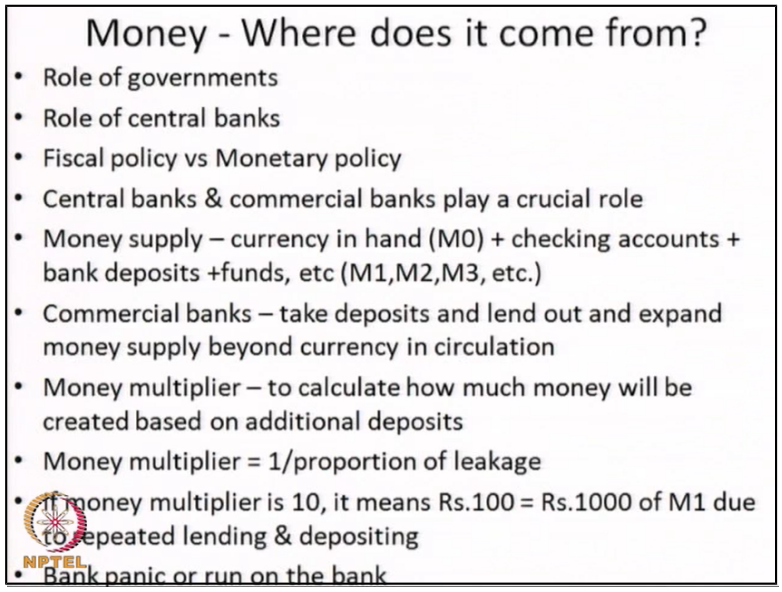

So, the essence of the discussion, as we began was, with money, and how it affects, 3 Key Macroeconomic variables. Now, where does this money come from. Let us try to understand, a little bit of money and banking. In most countries, it is only the Governments, that actually can issue the currency. It is the role of Government, that is very important, when it comes to issue of currency, which is actually the legal tender, and therefore required by law.

That, since it is a legal tender, it is the Government, that actually has a control over the money supply. And invariably, it is through the, Central Banks. In India, it is the Reserve Bank of India. In the US, it the Federal Reserve. Likewise, every country will have its own, Central Bank. And, it is this Central Bank, that prints and issues the money. And, it is this Central Bank, that actually frames the monetary policies. While, the Fiscal Policy, is done at the Government level. And, both Fiscal and the Monetary Policy, are two sides of the same coin, that determines the extent to which, money is in circulation.

So, we need to understand that, the Central Banks play a very key role, not only because, they

are the ones who are printing money, they are also the ones, who decide the extent to which, money can be circulated in the market. And, it is not only the Central Banks, but also the commercial banks, also play a very crucial role, in ensuring, that there is circulation of money. Because, money supply is not just the currency, that we have in hand, which is usually called, the M0-Money.

It is also the money, that is available in the, checking accounts, the bank deposits, in various mutual funds, and all other, denoted as, M1, M2, M3. So, it is this entire, M0 + M1 M2, and so on, that constitutes the supply of money. So, when it is not only the Central Bank, but also other commercial banks, towards the role of a commercial bank, is to take deposits, from those who save money, and lend it out. As a result of which, it expands the monetary base, which is more, than the actual currency, in circulation.

Imagine, for example, I have 100 Rupees in my hand. And, I go and invest this 100 Rupees in a bank. Now, the 100 Rupees that I had in my hand, is now, is in a bank. It is just changed, gone from one place to another place. Now, the result of this transaction, has not expanded the monetary base at all. Because, what was in my hand, is now with the bank. Now, how does the bank then, create an expansion in the monetary base.

Now, the role of the bank now is, to lend this deposit to somebody, who wants to borrow money from the bank. Now, this cash, that I have given to the bank, is what the bank is going to use, to lend to a borrower. The extent to which, a bank can lend to a borrower, is again limited by the Central Bank. I will explain about that, later. But, let us say, that there is a ruling, that all banks have to have a reserve of 10%. And, that is the reserve requirement. Which means, now the 100 that I have received, I can lend a 90 Rupees to somebody, who wants to borrow money.

So, I lend 90 Rupees, to somebody who wants to borrow. And, that person who borrows the money, uses that 90 Rupees. And, now that has, left the bank. And, it is in circulation. And, he uses it to buy, certain types of assets. And, results in some business income, which again, he puts it in a bank. And, from that deposit, another bank, gives out money. So, now, the circulation of money has increased, the monetary base has increased. Which means, in effect, the money has

multiplied because, we have given velocity to the money.

The money has, actually grown. Not just, we did not print extra money. It was the same 100 Rupees, that just multiplied across. We need to measure, to what extent, this money gets multiplied. And, that we measure from what we call, as the money multiplier, which is 1 **divided by,** the proportion of leakage. In this case, the proportion of leakage, is the measure of the reserve requirement. And, in this case, as I mentioned before, it is 10%. Because, I have to hold 10% of the deposits, before I give it to others.

So, if it is 10%, it means, the 100 Rupees that I put in, 1 **by** 10% is 10. Money multiplier is 10. Which means, the 100 Rupees, would have resulted in, Rupees 1000, due to repeated lending and depositing. So, this is the money multiplier effect. And, based on, how much money, that needs to be circulated, Central Banks usually change the reserve requirement. About which, I will talk later. Now, this will happen, as long as, there are deposits. It is loaned. It is, the money is used. More deposits. And, this will function, smoothly, as long as, there is no bank panic, or run on the bank.

What is run on the bank. Assume, one day, all of those, who have deposited money, demand, that the bank returns their deposits. And, the bank cannot say, no. Because, it is an obligation of the bank, to return the depositors money. Now, it is very unlikely to happen. But, assume that, every depositor, wants their money back, on the same day. And, this is what we call, a run on the bank. And, it was very common, in olden days. And, then came the Federal Deposit Insurance scheme. After which, you know, run on the banks, or bank panics, were limited.

But, anyway, that is a different subject matter for discussion. You just need to understand, that the circulation of money, is not measured by the actual hard cash, that you have on hand, or in the checking account in your bank. But, also measured by way of, the M1, and M2, equivalence. Which is because, that the bank is lending out money, to other borrowers, who in turn, use it for other productive purposes, and again gets back into the banking system, as deposits.

And, the extent to which, this circulation happens, depends on the reserve requirement, that each

bank has to meet. And, this is the, circulation of money. It comes, it gets printed, by the Reserve Bank. And, then in the presence of commercial banks, it gets circulated, in various forms. And, this is where, money comes, and gets circulated. Now, it is very important for us, hence to understand, the role of the Central Bank. In my view, the Central Bank is the spine of the economy.

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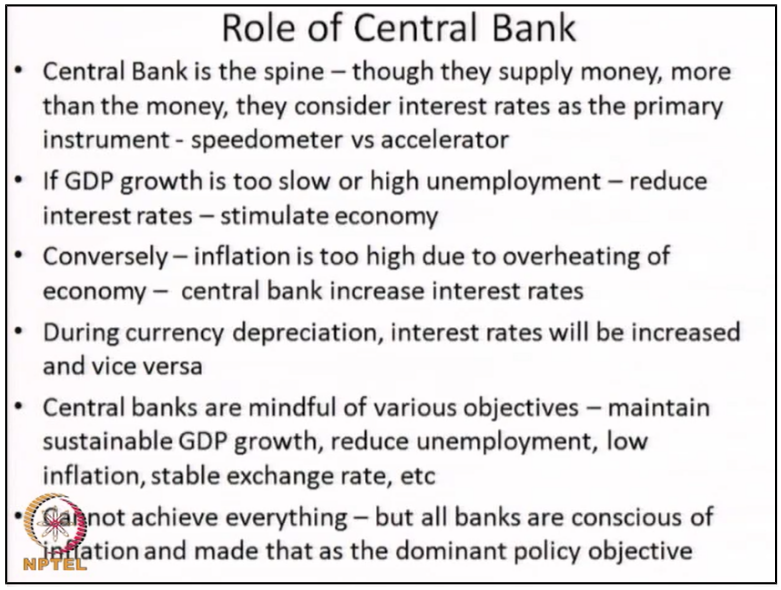

Because, they are the ones, who actually print the money. As a result of which, you have money. And, they are the ones, who supply the money. And, but more than that, they are the ones, who fix the interest rate. And, it is that interest rate, which is the primary instrument, that controls, the flow of money. If the interest rate is more, it gives me more incentive, to put my money in a bank account, and save it, than to spend it. If the interest rate is very less, then I would be better off, to spend my money, than put it in the bank.

And, based on what is required, interest rates will be changed by the, Central Bank. I will just give you a small example, for you to understand this better. Imagine, you are driving a car. And, you press the accelerator. And, the car increases, its speed of travel. And, you look at the speedometer. You think that, the speedometer, from 60 to 80, to 100, it is increased. And, it is the pressing of the accelerator, that has cost, the car to move faster. No doubt, it has cause, the car to move faster.

But, what actually happens inside is, the rate at which, because you press the accelerator hard, there is more fuel, the rate at which, the fuel gets discharged into the engine assembly, is the one that actually, makes the car move faster. So, the Reserve Bank of India, actually determines, what extent of money, should be let out in the market, by controlling the interest rate. Just as in the car, the extent to which, petrol or diesel, reaches the engine is controlled by, the accelerator pedal. Press it hard, more diesel. Interest rates are less, more supply of money.

So, this is how, the Reserve Bank operates. Let us say, if the GDP growth is very slow, there is massive unemployment. So, the bank will immediately, reduce the interest rates, to stimulate the economy. Because, at reduced interest rate, then there is incentive to borrow, and invest. As a result of which, there will be more business. And, as reduced interest rate, as a consumer, I would feel that, I am not incentivised enough. And hence, it is better for me to, consume, spend, than put my money in the bank.

Conversely, if inflation is too high, due to overheating, then the Central Bank will, increase the interest rates. Likewise, during the currency depreciation, interest rates will be increased, if the currency is depreciating a lot. Now, the role of the Central Bank is very, very critical. Because, it has to be mindful of, various objectives. Maintain, a sustainable GDP growth. The growth of GDP has to be sustainable. Unemployment levels need to be low.

There should be, a manageable inflation level, and a stable exchange rate. But, the Reserve Bank of India or for that matter, any Central Bank, does not have a magic wand, that will make sure that, all of this can happen. It is very difficult to achieve, all of this. But, all Central Banks are conscious, that inflation must be at, controllable levels. And, that has been the dominant policy objective, of all Central Banks, to ensure that, the inflation is at, manageable levels.

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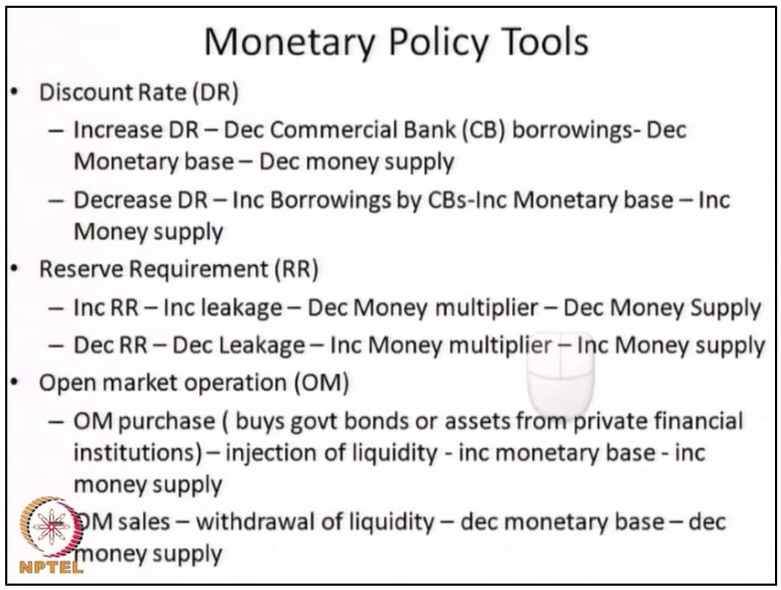

Now, how do Central Banks do that? These are referred to as, the Monetary Policy tools. The decisions taken by the Central Banks, are the Monetary Policy-making decisions. And, what are the different Monetary Policy tools, that are available, to have a check on the monetary base, on the supply of money. The first is the, discount rate. That is, the interest. Now, if the Central Bank decides to increase, the discount rate, or the interest rate, there will be less commercial bank borrowings. Because, interest rate, as I said before, is the cost of money.

So, if I increase the cost of money, it is difficult to borrow money. As a result of which, the monetary base is contracted. From another perspective, more interest rates, instead of having money in my hand, I put it in the bank. Because, there is more incentive, to save. So, it is in the bank. It is in the bank, and also the cost of borrowing, that money from the bank, is also high, because interest rates are high. As a result of which, there is contraction in the money supply.

Now, if the Reserve Bank thinks, that we need to expand the monetary base, I will have to let loose, the availability of money, what does it do. It decreases the interest rate. Now, if it decreases the interest rate, as a borrower, I would like to borrow more money from the commercial banks. Because, the interest rate has reduced. Now, there is increase in the monetary base. As a consumer, as I said before, I find no incentive, in putting my money in the bank. As a result of which, I start spending money.

What do I mean, by spending money? I am letting loose money, into the market. As a result of which, the monetary base widens, and there is increase in money supply. So, interest rate is one monetary tool, that the Central Banks use, to either increase, or decrease the supply of money. The next monetary tool is the, reserve requirement. Reserve requirement, as I said before is, it is a mandate from the Central Bank. That says, all commercial banks, from the deposits that are available, should have to maintain, certain reserve deposits.

Now, if I increase, the reserve requirement. It means, I am increasing the leakage. Now, if I increase the reserve requirement, I increase the leakage, one by leakage will be the, money multiplier, as I explained before. So, it decreases the money multiplier. If instead of 10%, I say, it is 20%. Then, that 100, that I deposit in the bank, instead of creating 1000 in circulation, would have reduced it to, 500. Because, my reserve requirement is no longer 10%, it is 20%.

On the contrary, if I reduce, the reserve requirement. Which means, there is decreased leakage. If I reduce it to 5%, let us say, then 1 by 5%, the money multiplier increases to, 200, 20. As a result of which, the 100, that was initially in the bank, results in 2000, as the quantity of money in circulation, because of the increased money multiplier. As a result of which, the monetary base has widened. So, the second monetary tool is, the reserve requirement, which the Reserve Bank fixes, again, it either increases, or decreases the reserve requirement, if it wants to reduce the money supply, or increase the money supply, respectively.

The third monetary tool, that the Reserve Bank uses, is the open market operation. Open market operation, either by purchasing, or selling. Usually, it is called OM. OM Purchase or OM Sales. Now, let us for example take, open market purchases. It means, the Reserve Bank will buy Government bonds, or assets from private financial institutions. If the Reserve Bank, buys Government bonds, it means, it is injecting money into the system. It is making the system; more liquid. It is injecting liquidity, into the system. So, a Reserve Bank, buys bonds.

So, if I buy bond, I buy it for a price. So, I pay money. So, it issues money, and widens the monetary base. As a result of which, there is more money supply. If the Reserve Bank, sells the same bonds. Which means, the bonds that the Reserve Bank had, or the assets from other

institutions that the Reserve Bank held. It sells it. So, when it sells, it has to get back the money, it sucks in money from the system, sucks out money from the system. As a result of which, the monetary base contracts, the supply of money is reduced.

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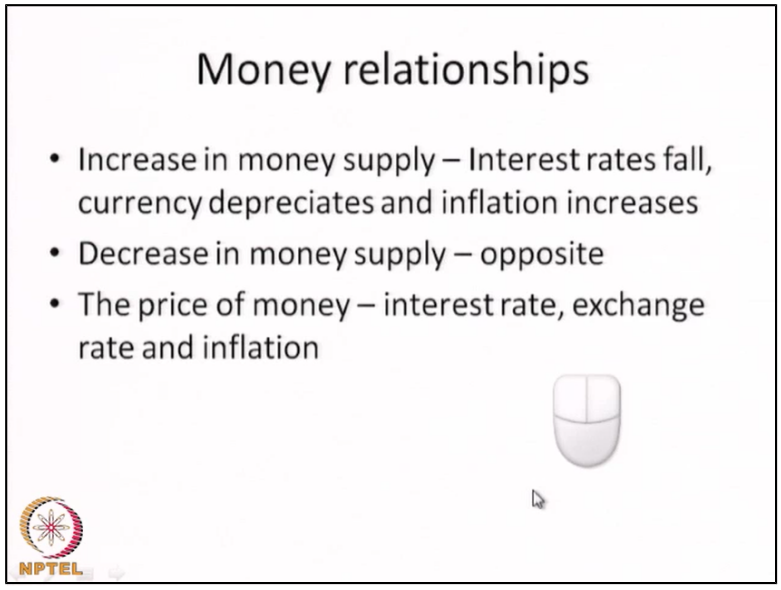

To summarise, three things, reserve requirement, the interest rate, and the open market transactions. These are the 3 Policy Tools, that the Reserve Bank uses, to control the supply of money. And, money relationship, is very, very essential, for us to understand, the Macroeconomic behaviour. As I said before, please have this in your mind, embedded.

Increase in money supply, will cause interest rates to fall, a currency to depreciate, and inflation. And, decrease in money supply, the opposite. And, the price of money, relative to time is interest rate, relative to the currency it is exchange rate, and relative to the aggregate price level is the inflation. Because, I said, it is price because, each of this has a cost for money.

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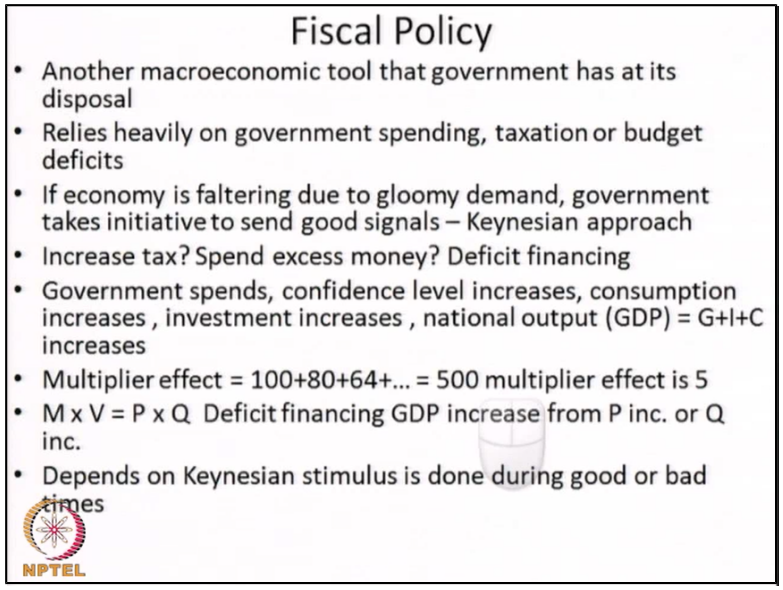

Now, on one hand, you had the Monetary Policy, which was more the prerogative of the Reserve Bank, or the Central Bank in general. Another Macroeconomic tool, that the Government has at its disposal, is the Fiscal Policy. Here, it relies heavily on, how the Government wants to spend its money, how it receives money through taxation. So, a Government is the one, that actually frames the Fiscal Policy. Now, let us for example, take a case, where the economy is so bad.

And, one of the classic examples, that economists usually use, to explain this, is the great depression. So, the 30's in the United States, there was a gloom, in the economic environment, a great depression. As a result of which, the Government had to come forward, and instil some confidence. As a result of which, the Government decided to spend, a lot of money. And, this is the Keynesian Economics, named after the great Economist, Keynes.

So, Keynesian approach, is making the Government, to spend first. During, times of tough economy, it is the Government, that takes the first initiative, to send the good signals, to businesses, and other consumers. It is not by increasing tax, that the Government wants, to increase its revenue. It is by, spending more. And, where do I get it. This is called, the deficit financing. By spending more, I will first send good signals, to the consumer, or the businesses. Because, what happens when the Government spends.

When the Government start spending, let us say, I am spending 100 Rupees. I am the

Government; I am spending 100 Rupees. The confidence level of the average consumer, will increase. He sees some economic activity, and he also start spending. As a result of which, consumption increases. So, when consumption increases, there is good news to businesses. Because, they see somebody, there is a demand, for its goods and services, and there is incentive to invest.

So, investment increases. As a result of which, the national output, which is the GDP, because remember, GDP is Government spending, consumer spending, and investment, all three put together. So, let us say, the first level, the Government decides to spend, 100 Rupees. So, Government spends, 100 Rupees. And, this has resulted in, a national income of 100 Rupees. And, just look at this, presentation.

So, imagine that, there is a change in consumption. Let us say, an average household, has 20% savings, and then consumes, the remaining 80%. Which means, he spends the remaining 80%. So, if the Government initiated, an additional 100 Rupees spend, because of the additional incremental income of 100, the household will spend, another 80 Rupees.

Now, with this additional 80, which gets injected into the economy, creates another income of 80. And again, the multiplier effect is, I spend 80% of that 80, which is 64. Again, 80% of 64, this keeps on going. So, the multiplier effect is, I began with a 100, spent by the Government, which has created in this multiplier effect, as a result of which, we have added 500 to the national income, the national output. Now, this is because, of two things.

One, the multiplier effect has increased, the circulation of money in the economy, the velocity of money has increased. And, as a result of which, there is an increase in GDP. Now, this resultant increase in GDP, has to be matched by, either an increase in price of the commodities, the goods and services, or the quantity that has been produced. Now, whether it has come from, increase in price, or the quantity, depends on, what time, has this Keynesian stimulus, or the Government spending, has been initiated.

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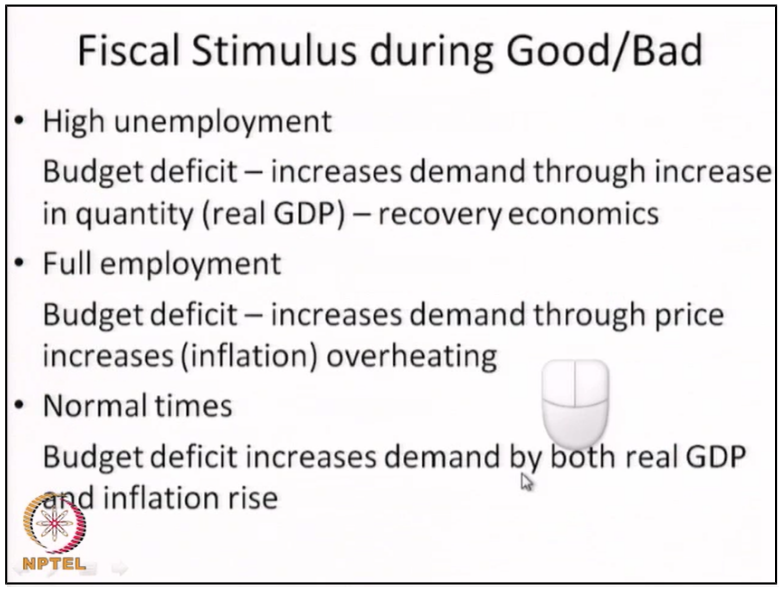

So, let us say, the economy is very tough, very high unemployment, so there is deficit financing. So, the Government has to increase, through increased quantity. Because, unemployment levels, you cannot increase the GDP, by increasing prices. We have to make the assets, more productive. And, increase in GDP, is because of, increase in quantity. And, this is called, Recovery Economics. This is the, Real increase in the quantity. Let us say, the economy is already, operating at full capacity.

Then, the increase in GDP, is not by increase in quantity, because already it is in full capacity, it has to be increased by, price increase. So, it is more inflationary. So, this is an overheated economy. So, we need to have a balance. And, that is why, at normal times, a budget deficit, increases demand by, ensuring that, there is an increase in quantity output, and to a certain extent, even inflation. And, that is where, we need to strike a balance. So, what we have done in this class is, we have understood the importance of money, being the fundamental economic unit.

And, how it relates itself to, interest rates, inflation, and exchange rate. And, the role of Central Banks, in controlling, the supply of money, by using monetary tools like, interest rate, reserve requirement, and open market purchases. And, apart from the Monetary Policy, the Government also, through its Fiscal Policy measures, will try to change the economic scene, by first sending the good signal, that the Government volunteers first by spending on its own, by creating a deficit, which is financed, I will explain this later.

And then, send the good signal, that since the Government is spending, there is recovery possible, and then there is consumerism, there is also investment. As a result of which, the GDP also grows. So, we have understood, money. We have understood, the 3 Macroeconomic variables. We have understood, the role of Central Bank, and the role of the Government also, to bring about change in, economic activity.

Now, the next class, I will just try to explain, what this Fiscal Policy is? And, how that the budget, which is the Government's statement of expenditure and income, how we need to interpret, the budget, that the Government comes out every year. And, a few key terminologies, that you need to understand. And, this, we will see it, in next class. Thank you.