**International Economics**
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Lecture No. #18

Good afternoon, we are starting with new topic which is asset markets, exchange rates and economic policy. Here in we will assume that each investors, speculator is a risk averse person. So, the households will acquire three types of assets, which will be domestic bonds, foreign bonds, and money; and these three together will constitute wealth of the economy. So, it is deviating from the monetary approach to balance of payment there you had assumed, that each investor is a risk neutral person. So, he would consider domestic, and foreign bonds as perfectly substitutable. But here in this approach in the asset market approach, you assume that each one of you or the households are risk averse. So, they would like to hold all three types of assets, one is domestic bonds, the other is foreign bonds, and the third is the money, the the idle money that you have.

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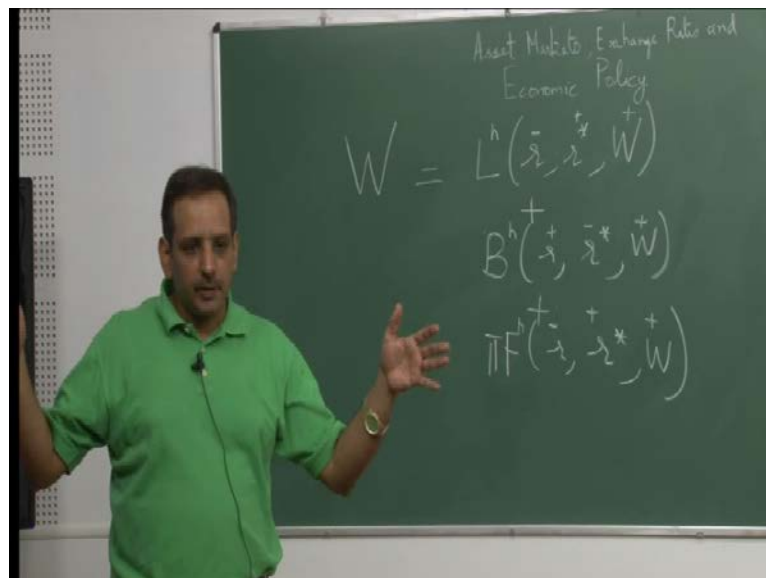
So, the wealth there is an important role of wealth, remember wealth is income from all sources productive, and non productive. When we discuss national income we generally talk of income from productive sources. So, my wealth would be income from all

sources, the money that I earn in IT, and the money say if I had invested in stocks and bonds the interest that I get, all sources of income together constitutes wealth.

In here, in this model wealth constitutes three things, it is the, this three types of assets which are owned by the households, one is the money the idle money, the other is the bonds domestic bonds and the third is the foreign bonds.(No audio from 02:51 to 02:56) So, these three constitutes wealth of a person and this money demand, the bond demand and the foreign demand for the foreign bonds all three are a function of the domestic interest rates, the foreign interest rates and the wealth.

Money demand this is negatively related with the interest rates, higher the interest rates, lower is the demand for money, this is positive, this is positive. More wealth you want to have more of money, this is positive, higher the interest rates, higher is the demand for domestic bonds. In here you have these three assets constituting the wealth in the economy. So, what I will do first is I will try to first give the base of this approach, this is the asset market approach to balance of payment. We in that basic would consider certain relations which are different from the earlier approaches.

Sometimes you will find that, it gathers ideas from the things that we have already discussed. So, it is like an the earlier approaches that we had discussed. So, in some context it will be different, but in some context it will be just you will find that it is an (( )) of the earlier approaches that we had discussed.

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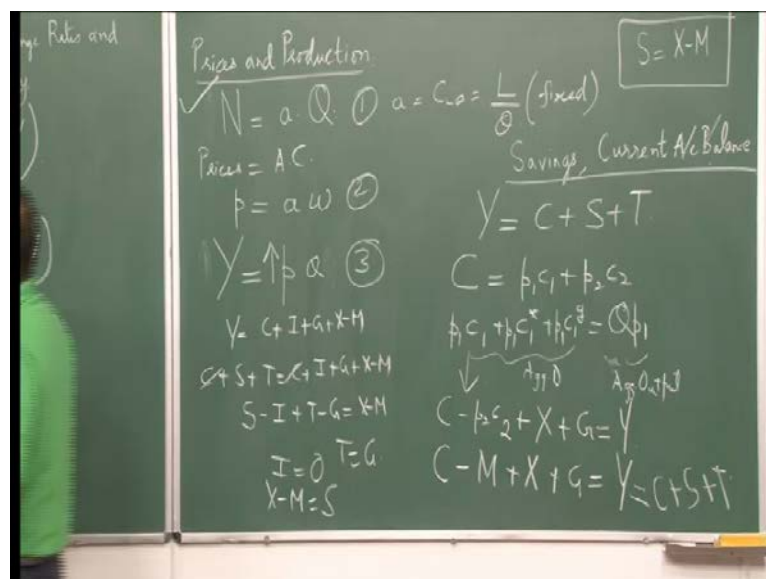
So, we start with prices and production. Now, please recall in the monetary approach to balance of payment, you had assumed that income is at the full employment level and wages and prices were flexible so, output was at the full employment level. Here you will see that, you can have various possibilities, now here it is borrowing something from the Ricardian model, this is trade model, Ricardian trade model.

(No audio from 05:41 to 05:56)

Is the amount of labour per unit of output, this employment is a function of output, where this a, which is the amount of labour per unit of output, this is fixed. Then prices are equal to the average cost. So, you have p is equal to a w, where a is L Q. So, prices are equal to the average cost and you have output which is p into Q, which is the national income. So, Y is equal to p q.

Now, here you have these three equations. Now, if you read through these three, there are various possibilities which can happen. If you assume that the prices are constant, if you are assuming that the prices are constant and employment changes. So, if employment changes this is changing right this is fixed. So, this has impact on the output now. So, if there is an increase in national incomes and employment changes you will not see a change in p, but you will see a change in the output. So, here it deviates from the earlier approach, where we had assumed that output is fixed at the full employment level, but there is another possibility.

If you assume that employment is fixed and you have wages and prices which are flexible. So, any increase in incomes will also lead to an increase in national income, but through the increase in the prices because output would remain the same. So, you have both these possibilities coming in this approach. Output can change, if employment changes or if prices change then you would say, you would the prices and wages are flexible, then increase in incomes lead to increase in national income. but through an increase in the prices, output remains the same in that cases. So, both possibilities can happen you can see an increase in output or you can see an increase in prices.

So, this is one second is a relation which is similar to the earlier approach, monetary approach to balance of payments. That was a relation between savings and current account balance. Please recall that in the monetary approach to the balance of payment you had assumed savings to be equal to X minus M. Any current account surplus would

mean savings, positive savings any current account deficit would mean disserving or negative savings.

Here also, we will get the same relation, but the steps involved are little different. So, it starts with Y being equal to consumption plus savings plus taxes and C to be equal to $p_1 c_1$ plus $p_2 c_2$. Now, please recall $p_1 c_1$, c_1 is the demand for this is the export good, this, the price of the export good, this is the price of the imported good. So, then the total consumption is $p_1 c_1$ plus $p_2 c_2$, then you need to think in terms of the aggregate demand. Aggregate demand consists of c_1 plus c_1 star plus $c_1 G$ this is equal to Q.

Now, think of this as the aggregate demand, this to be equal to the aggregate output. Why aggregate demand? This is consumption of the export good or the domestic good, it is the domestic good which is been exported. So, it is the price of the domestic good and the consumption of the domestic good, this is the consumption of the domestic good going into the foreign country, this is the consumption by the government.

So, it is the same aggregate demand, if you multiplyit with p1, p1, p1 what you would get would be C minus $p_2 C_2$ plus exports plus G to be equal to Y. $p_1 c_1$ to be equal to C minus $p_2 c_2$, c_1 is the domestic good so, the price. So, $p_1 c_1$ is C minus $p_2 c_2$, $p_1 c_1$ star is your exports $p_1 c_1 G$ is your government expenditure, this is equal to Y now C minus $p_2 C_2$ is M plus X plus G is equal to Y.

So, we give, we are arriving at the same national aggregate. Please recall the national aggregate I would do it C plus I plus G plus X minus M, then I, this side I would say C plus S plus T is equal to C plus I plus G plus X minus M C and C cancels. So, you get savings minus investments plus T minus G is equal to X minus M.

So, in this monetary approach or in the asset market approach there are no investments, T is equal to G, so, X minus M is equal to S. So, here also we are arriving at the same thing C plus X plus G is equal to Y plus M and Y is C plus S plus T. And so if you assume that it is a balance budget investments are 0 or if you solve this, you will get again this relation that savings is equal to X minus M. So, even in this because if Y is C plus S plus T, C plus S plus t. So, C and C will cancel X minus M you would get to be equal to T minus G, T minus G it is a balance budget.

So, you would have savings to be equal to X minus M. because this is equal to C plus S plus T and C and C would cancel T is equal to G, so, savings would be equal to X minus M. So, even in this approach, you would have savings equal to X minus.

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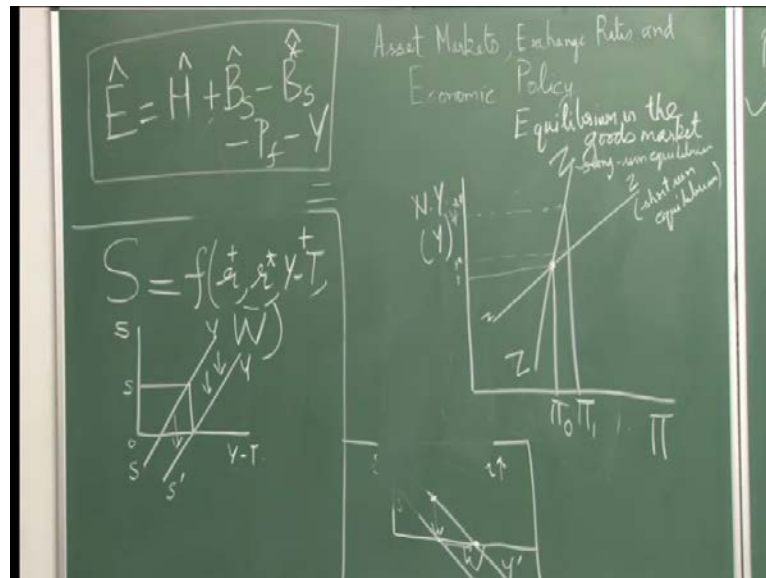
So, we have prices and production, we have a relation between savings and current account balance. The third thing that we have is, savings now here it will deviate from the monetary approach to balance of payment, is a function of r r star Y minus T and wealth. It is directly related with the interest rates, higher the interest rates, higher the savings, higher the disposable income, higher the savings.

Now, here comes something which is little different from the earlier approach, higher the wealth lower is the incentive to save. So, it is like you have accumulated lot of wealth you have income from all sources, but now higher the wealth you have a lower incentive to save. So, then there is this inverse relationship between savings and wealth.

So, if you have savings on the Y axis and if you have disposable income, (No audio from 15:50 to 15:58) now, see what happens? (No audio from 16:01 to 16:06) and like the monetary approach you will have a short run phenomena and you will have a long run phenomenon. Remember the monetary approach you had the short run behaviour and you have a long term behaviour were any disequilibrium gets wiped out over time.

If you recall, when you increase money supply, when we were discussing the monetary approach to balance of payment it will lead to excess supply of money, which is equivalent to saying that there is excess demand for goods and bonds. So, there will be balance of payment deficit, this was the short run thing, that increase in money supply leads to a deficit in the balance of payment.

But, in the long run if it is fixed exchange rate and you a have a balance of payment deficit, the central bank will start losing reserves. So, when the central bank will start losing reserves, the money supply will come down any excess supply of money would be wiped out over time. Here also, you will have a short run and long run relationships.

Now, look at this you are trying to understand relationship between savings and disposable income remember disposable income is any income after paying the taxes. So, if there are positive savings now see what happens to this S Y curve it is starts shifting down reason higher savings leads to higher wealth. So, savings adds to the wealth, but then as the wealth increases, there is a disincentive to save. So, this S Y curve will shift down and in the long run you will see a situation where savings are 0, current account surpluses is 0, you reach this long term equilibrium.

So, in the long run no savings, 0 savings, 0 current account balance that happens in the long run and remember S and Y minus T this is the relationship. So, if you are starting relationship between savings and disposable income all other factors would be the shift factors. So, what I am saying is that say for example, you start by having positive savings, if there are positive savings it adds to the wealth, but the story does not end there as wealth increases it has a negative impact on this savings.

So, this curve shifts down, savings comes to 0 in the long run, underline long run, current account balance comes to be 0 in the long run. Another relationship between say savings and wealth, (No audio from 19:15 to 19:25) say if you have a situation where savings are 0, wealth is w and you have a negative relationship because in this approach savings and wealth are negatively related. So, this is a situation where savings are 0, it is a long run equilibrium, wealth is w. Now, what happens say for example, interest rates go up if interest rates go up remember all others will be the shift factors. You are trying to study relationship between S and w r goes up, so, savings go up.

Savings go up, see what happens? Savings are here. So, savings go up, wealth goes up. Savings goes up, wealth goes up. Now, when the wealth goes up there is something else which happens? It tends to reduce savings. And as a result, as you see an increase in wealth, the savings come down till you reach a situation where the wealth has gone up, savings has come down to 0, current account balance is 0. Now, all this can be very well addressed in a frame work where you would study equilibrium in the goods market, in the short run and in the long run.

So, whatever we have done it can be all depicted by a very nice diagram showing the equilibrium in the goods market. So, that is what we are going to do, we going to discuss the equilibrium in the goods market. So, here look at the diagrams, we are talking of equilibrium in the good markets. (No audio from 21:32 to 21:40) Well, I can tell you the end story also, I can straight away tell you the end story. The end story that we will have you will see that your.

(No audio from 21:52 to 22:08)

So, the end story will tell us that the change in the exchange rate will be a function of the increase in domestic credit. It will be a function of the supply of the domestic bonds, it will be a function of supply of the foreign bonds, it will be a function of the price prevailing in the foreign country, it will be a function of the incomes.

So, then at the end, when we discuss all this you will see that exchange rate will now be a function of not only domestic credit incomes price is in the foreign country, but also the supply of domestic bonds in the home and the foreign country. So, that equation that I wrote yesterday that exchange rate is a function of differential interest rates, differential inflation rates, forward premium, differential money supply, differential output, differential supply of bonds. This will be another factor which will come on the right hand side. So, the correct specification will be will be this at the end.

Anyway we will come to this later on, how will this have an impact on the exchange rate? So, let us study this equilibrium in the goods market both in the short run and the long run, so, the difference is here you would have national income on the Y axis. So, you will have Y on the Y axis that is national income and you have pi on the on the X axis. And there is something which is the z z, small z z curve which shows the short run

equilibrium and you have the big z z curve more steeper than the small z z curve showing the long run equilibrium.

What is long run equilibrium in this approach? It is also called the portfolio balance approach, portfolio balance. because you have a portfolio, you have a portfolio of money, you have portfolio of domestic and foreign bonds. And you are holding all three because now you are not risk neutral you are all risk averse. So, you have a long run equilibrium, you have a short run equilibrium. What is long run equilibrium?

Long run equilibrium was an equilibrium where in the savings would be 0, the current account balance would be zero. but in the short run, see if you are here this is the point where you have both short run and long run equilibrium. So, this is pi 0, say if you are the domestic exchange rate depreciates and you reach pi 1. Now, see z z curve and both z z curves are upward sloping. Now, look at the small z z curve, which shows a short run equilibrium it is says that if you depreciate your currency, the current account balance will become positive because of the marshalllerner condition holding.

So, if the marshalllerner condition holds, devaluation will improve the current account balance. And you know that when the current account balance improves it also improves the national income. So, you have an upward sloping z z curve. So, in the short run, the if, this devaluation it leads to current account surplus and it leads to an increase in savings and there is an increase in incomes. but this is only short run behaviour, in the long run you can see that the incomes rise beyond this, beyond the short run, in the short run it irises from what it was here in the long run, it raises to Y double star.

Now, what prompts this type of behaviour in the long run? Now, remember long run is a time, where savings are 0, current account balance is 0. So, something needs to happen beyond this, beyond Y star such that your savings turns out to be 0, your current account balance turns out to be 0. Now, can you think that why incomes will rise beyond this to reach a point like this on the big z z curve which shows the long run equilibrium. So, if you think it over the reason is, if you were here at Y star you had positive savings and you had current account surplus. Now, if you have to have long run equilibrium savings have to be 0, current account surplus has to be 0.

So, what should rise such that savings are 0 and current account surplus is 0, can you think, what needs to rise? Absolutely, wealth and incomes, incomes also have to rise

beyond Y star. Why because remember higher the incomes, higher the imports, lower is the current account surplus so, current account surplus has to wipe has to become 0. So, incomes have to go beyond Y star to Y double star and then wealth also has to rise because higher the wealth lower is the savings.

So, income takes care of the current account surplus because higher the income higher the imports that takes care of the current account surplus wealth takes care of the savings. So, in the long run although the each point on the z z curve shows new levels of wealth, but then it shows that the economy is back in equilibrium. Equilibrium in what sense savings are 0, current account balance is 0.

So, then we will study this equilibrium in the goods market and then if you have to analyse the asset market approach then we have to bring in the shocks in the economy. What will be the shocks? Shocks can be increase in foreign expenditures on our good. That means, what happens if our exports go up, what do you think will happen to the small z z curve or and the big z z curve, if the expenditures on our good increases?

Naturally, when our exports go up through the national income our national income has to go up. So, the z z curve will shift up. What about the big z z curve? Small z z curve shifts left upwards, it upwards because higher the exports, higher the incomes. What happens to the big z z curve, if there is an increase in expenditure on our good by the foreigners?

So, our exports go up, there is a current account surplus. If current account surplus has to be taken care, what do you think will happen, what needs to rise to take care of the current account surplus, the incomes? So, if the incomes have to rise, the z z curve has to also shift upwards. So, when we discuss when we come back and discuss the shocks and if this happens increase in expenditures, foreign expenditures on our goods the z z curve and the big z z curve will shift up.

What happens, if say interest rates or wealth goes up? If interest rates go up, what do you think will happen to the big z z and the small z z curve? Interest rates go up, savings go up, what comes down? What comes, consumption comes down. So, what comes down then if consumption goes, incomes come down. So, what will happen to the z z curve? It shifts down absolutely, it shifts down because of the increase in the interest rates. What happens to the big z z curve will it change or will it remain the same with an increase in

interest rates? Remember that shows the long run equilibrium where eachpoint shows that the wealth the the level of wealth is different, but savings are 0, current account balance is 0. So, will the big z z curve change with the change in interest rates and wealth. There will be no change in the big z z curve because in the long run savings are 0, current account balance is 0.

What happens if the wealth goes up? If the wealth goes up so, savings comes down. Savings comes down, what goes up? Consumption goes up and income goes up. So, the small z z curve will shift up all right. So, remember these things because we going to come back to the goods market when we discuss the shocks. The shocks would be the change in interest rates, the change in wealth, the change in foreign spending on our goods.

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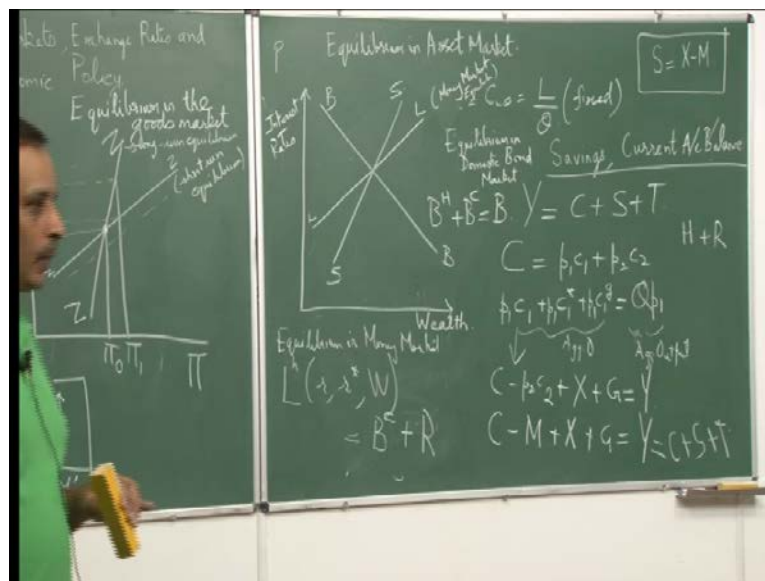
Let us quickly discuss the asset market approach the equilibrium in the asset markets. Then we going to come back and discuss the shocks so, this is the equilibrium in the goods market. Now, we going to discuss the equilibrium in the asset markets. (No audio from 33:46 to 33:53). Something more, I just deleted remember the you had the three assets, the money, the domestic bonds and the foreign bonds. So, if you have to talk about equilibrium and if you are aware of the walrus law then it is sufficient to discuss two markets only. because if two markets are in equilibrium, according to the walrus law, the third market should be in equilibrium.

So, let us discusss the money market equilibrium, remember the money market equilibrium. So, who holds the money we hold the money r star wealth the suppliers are the central bank, but now they indulge in open market operations for changes in the money supply. So, remember we discussed money supply to be equal to H plus r where we said H is the domestic credit and r is the reserves.

Remember I talked about sources of changes in high powered money, when the central bank, when the commercial bank, when the, not the central bank. The central government, the state government or the commercial banks wants to borrow from the central bank. Then I put all this under H and I called that as domestic credit, domestic credit plus reserves where the money supply. Now, this here is replaced by.

(No audio from 35:50 to 35:03) Now, look at this, the domestic bonds now, are held by C the central bank. So, if there is an increase in open market purchase of domestic bonds, it is equivalent to saying that there is an increase in h. So, this is open market purchase of domestic bonds by the central bank denoted by C changes in reserves also brings about changes in the money supply. So, the equilibrium in the money market is given by money demand, only you demand money, firms do not demand money, you demand money. But the bonds demand is by two institutions one is the central bank and the other is you people. Because remember wealth is equivalent to three things, three assets idle money, domestic bonds and foreign bonds.

So, domestic bond, the demand for the domestic bonds is coming from us and from the central bank. So, higher the open market purchase of domestic bonds, higher will be the increase in money supply. So, this plus this, this is the supply of money, this is the demand for money, this shows equilibrium in the money market. What about equilibrium in the bond market? Equilibrium in the bond market in domestic bonds (No audio from 38:12 to 38:19) it is B h plus B c is equal to B, this is supply of bonds fixed because we are assuming balanced budget.

So, B is equal, G is equal to T whatever is the T is the is the G and so, this is fixed B is fixed, supply of bonds is fixed, this supply is equal to the demand for bonds. Two people demand bonds, one is you households, the other is the central bank. If they start demanding more of bonds that is like open market purchase of domestic bonds in turn it increases the money supply in the economy. When you buy bonds, it increases money

supply. When you sell bonds, it decreases money surplus. So, this is equilibrium in the bond market this is equilibrium in the money market, if these two simultaneously hold then foreign, you will have equilibrium in the foreign bond markets.

So, then how do you show it through the diagram, here the differences on the Y axis you would have interest rates and on the X axis you will have wealth. (No audio from 40:04 to 40:19) So, look at these three curves, one is the L L curve which shows all combinations of interest rates and wealth which will give you money market equilibrium. All combinations of interest rates and wealth which will give you money market equilibrium. So, L L is the money market equilibrium. Why is it upward sloping? Higher the wealth, higher is the demand for money, the only way the demand for money can come down will is through an increase in interest rates.

So, that is the reason that it is upward sloping, higher wealth leads to higher demand for money. Higher demand for money can be curtailed only if interest rates go up because that decreases the demand for money. So, it is upward sloping. What about B B curve which shows all combinations of interest rates and wealth, which will give you bond market equilibrium.

Why is it downward sloping? Higher the wealth, higher is the demand for the bonds, domestic bonds the only way that this increase in demand for bonds can come down is to reduce the interest rates so, it is downward slope. There is an interesting curve, which you will see when we discuss the shocks is an S S curve, which is showing this particular relation. And it shows that the at all points this shows the long run behaviour where the savings are 0, current account balance is 0.

So, why is it upward sloping because higher the wealth, lower the savings. if you have to increase the savings, you have to increase the interest rates so, that is the S S thing. When can LL curve shift up and down? When there is an increase in money supply. When there is an increase in money supply, what do you think should happen to the L L curve? You are trying to show that it is there is a money market equilibrium money supply has gone up. So, something has to increase to equate the increased money supply to money demand. So, money demand also has to go up the only way the money demand can go up to is reduce the interest rates.

So, you will see that when an increase in money supply or if there is an increase in open market purchase or there is an increase in reserves, the L l curve will shift down. What about the B B curve which shows bond market equilibrium, what happens if there is an increase in open market purchase of domestic bonds? This goes up, this shows bond market equilibrium, this is fixed. So, what needs to come down? Sorry, not B H, B C has gone up, this is this is constant. So, what needs to happen such that you have equilibrium in the bonds market? B H has to come down. If B H has to come down, what do you think will happen to the B B curve? So, that you have this equilibrium, a leftward shift.

So, here are some basics about this approach also called the portfolio balance approach. Tomorrow we will see, what happens if shocks are given in the say shocks are given in this economy, what will happen to the goods market and what will happen to the asset market? To to the to the asset market, and then we will we will study, how at the end, how exchange rates are determined when you manage a portfolio? You not only have domestic and foreign bonds, but you have money with you. So, that we will discuss it, tomorrow.