International Economics

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Lecture No. # 17

Today, we will further discuss the monetary approach to balance of payments. This approach as you know is about the balance of payment and it says it is that the balance of payment is a monetary phenomena. According to this approach any balance of payment disequilibrium is a temporary phenomena. Any surplus or deficit which occurs in the short run gets wiped out in the long run.

So, let me just quickly write the equations which were relevant for the monetary approach to balance of payment. And then at the end we will see how relevant equation comes out of this monetary approach to balance of payments which can be a useful equation because that equation can help us to determine; what are the factors which have an impact on the changes in the exchange rates.

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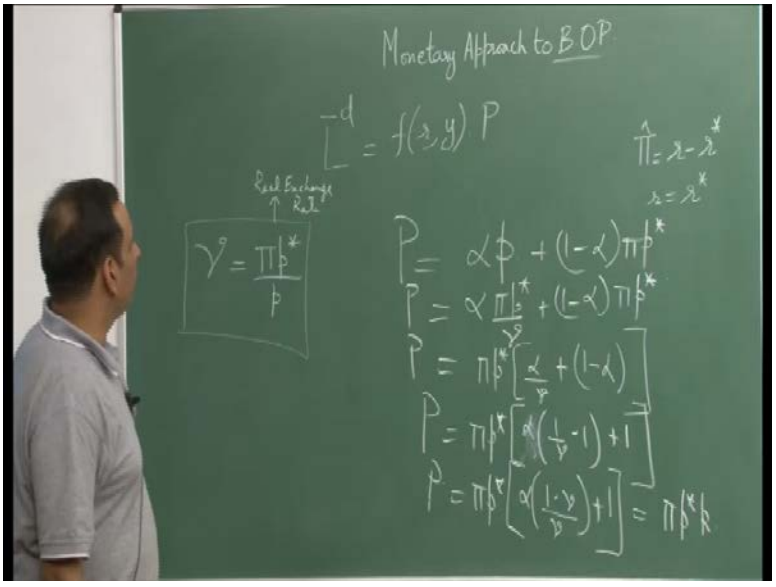

So, if you recall here the focus of attention is on the money market, but in the money market the demand for money which is a function of rate of interest and incomes and the

prices. This is fixed because one the interest rates the domestic interest rates are related to the foreign interest rates through the open interest parity. And you further assume that there are stationery expectations. So, r is equal to r star and r star is fixed that is the foreign interest rates are fixed. So, the domestic interest rates are fixed. This is fixed this does not change in the monetary model. Incomes are at the full employment level. It is an extension of what the classical economies thought that the income is already at the full employment level and the assumption behind it is that the wages and prices are flexible.

So, the output is fixed at the full employment level and P which is a weighted average of the prices of the domestic and the imported good is a function of the exchange rate. And if you further assume that the exchange rate is fixed you will see that prices are of are intern fixed. So, this P which is a price index which is a weighted average of the domestic prices of the goods which are also exported plus the prices of the imported good expressed in domestic currency.

And then they have an important assumption relating domestic and foreign prices through the P P P theory, purchasing power parity theory which says that the real exchange rate real, exchange rate is a reciprocal of the terms of trade, terms of trade is price of exports by price of imports, but the real exchange rate is the price of imports divided by price of exports. This is considered to be fixed in this approach.

So, this is a way of relating domestic prices with the international prices. This chapter 22 of the fenestrate and Taylor they go into the question why you do not see there this happening? Why are the prices quite different from the prices of the same good in your country? And they have whole lot of reasons for that, but here they assume that this is a constant. This is the real exchange rate if this is constant. So, you get alpha and then pi P star pi mu (No Audio Time: 05:43 to 06:25).

So, this P which is a weighted average of the domestic and the imported prices. This is the price of the imported good expressed in domestic currency. So, this is a function of the foreign prices which is also constant. Exchange rate if you assume a fixed exchange rate. So, this is like fixed, this is fixed. P star is fixed, k is a constant. So, you have P which is also a constant. So, the money demand function wherein the rate of interest is

fixed, income is at the full employment level and P S is fixed. So, you have a money demand function which is not changing which is like fixed.

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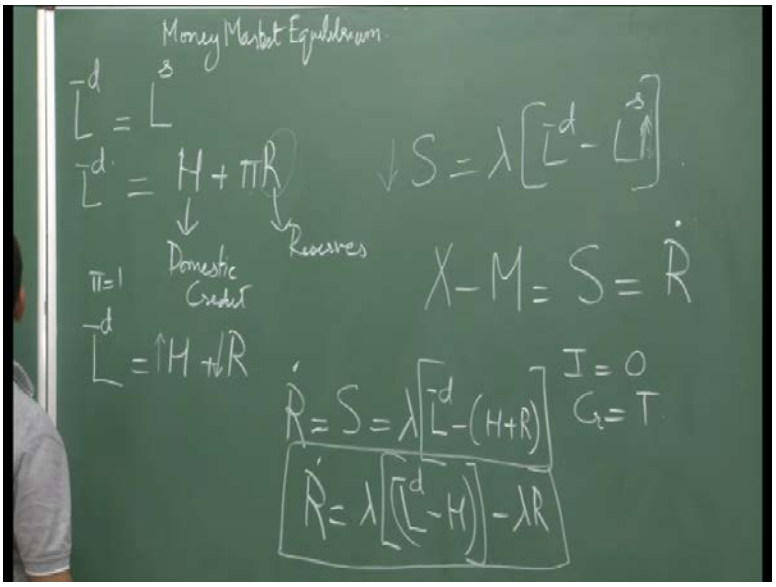

But, the equilibrium you have a money market equilibrium wherein you will have L bar d equal to L s this is money market equilibrium. And money supply is in the hands of the government. This is equal to H plus pi R, this is the domestic credit, these are the reserves this is the exchange rate. So, this is the entire money supply and you have equilibrium where money demand is equal to the money supply.

So, then further if you assume pi to be 1 this is H plus R. So, think of this as if there are changes in the high powered money. This is because the government borrows; the central government borrows from the central bank. The state government borrows from the central bank. Other banks borrow from the central bank and because there are changes in the foreign exchange reserves. These tend to have an impact on the money supply.

So, if you go through the relevant portions in monetary economics. It will have a chapter on sources of changes in high powered money. High powered money is the central banks money and the different sources of changes in high powered money is the domestic credit that they gave to the central bank, the state governments, the central governments, the commercial banks and because there are changes in the foreign exchange reserves. So, then L bar d is H plus R. That is the long run equation in the monetary approach to balance of payments. And see how it works if you increase domestic credit then there is

excess supply in the money market and its related to the other markets through the walrus law. So, if there is excess supply in the money market there need there has to be an excess demand in the goods and the bonds market. This excess demand in the goods and the bond market equivalent to saying that there is a balance of payment deficit.

So, in the short run as soon as you have an increase in the money supply you will see that there is a balance of payment deficit that short run. Now, when it is a fixed exchange rate and you have a net outflow of foreign exchange and if you want to maintain that foreign the price of the foreign exchange then someone has to intervene in the foreign exchange market to maintain that parity. And that someone is the central bank it has to intervene in the market to supply that much of foreign exchange. It would lose reserves; it would mean the central bank would lose reserves.

So, when they lose reserves the money supply goes down. So, in the long run whatever was the disequilibrium that existed in the money market is wiped out because there are changes which exist which happen in which change the reserves. So, you would see that eventually the balance of payment deficit is wiped out. You have a balance of payment equilibrium in the long run this was the long run. The short run behavior was through the savings function (No Audio Time: 11:28 to 11:35) and here you had assumed that investments were 0. Government expenditure was equal to the taxes there was a balance budget.

So, any current account surplus or balance of payment surplus is will lead to positive savings which would lead to an increase in reserves when you have a fixed exchange rate regime. So, then say if there is an increase in the money supply. Again the same point if you increase the money supply there will be a decline in savings. The decline in savings would mean that there is an increase in consumption expenditure increase in expenditure on goods and bonds which is equivalent to saying that there is a balance of payment deficit.

If there is a balance of payment deficit and if it is a fixed exchange rate regime reserves will come down. So, any increase in L s will be negated in the long run any disequilibrium which will exist in the money market initially will be wiped out over time. So, in the long run this will be balanced. There will be no impact on savings, there will be any balance of payment disequilibrium. So, eventually any disequilibrium will be

taken care in the long run. Any surplus or deficit according to this approach is a temporary phenomenon. It will be wiped out in the long run.

So, then if you further work on this equation you will get R dot to be equal to S is equal to L a lamda L bar d minus H plus R. So, you will get R dot (No Audio Time: 13:57 to 14:07). Now, see this equation we are trying to relate stocks with flows. R dot is equal to lamda L bar d minus H minus lamda R. So, in the last lecture I left it at this point and then I wanted to draw this. I wanted to explain this equation through the diagram.

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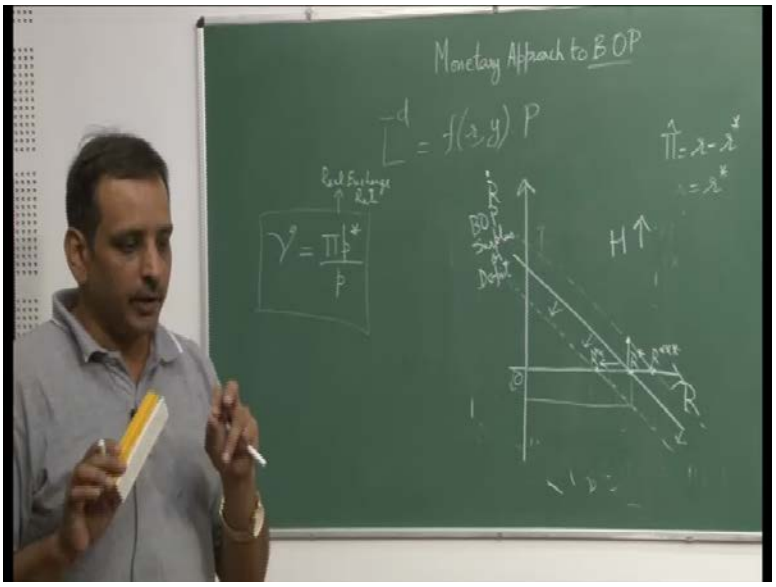

So, I can do it here. So, on the y axis you would have R dot or balance of payments surplus or deficit (N Audio Time: 14:46 to 14:52). If it goes below 0 you would have a deficit. This would be this line. This is the equation of a straight line. You can see that you have an intercept term and you have the slope which is given by lambda. So, now, if you see H, H going up. If H goes up this goes up this intercept comes down.

So, you have R dot here you have R here. So, this is a case where H goes up. So, when H goes up that is the domestic credit going up there is a excess supply of money. Excess supply of money is equivalent to saying there is a excess demand for goods. Excess demand in the goods and the bond market. So, you have a balance of payment deficit. So, in the short run if H goes up. Please have a look at the balance of payment it falls below 0. You have a balance of payment deficit anything above 0 is surplus anything below 0 is deficit.

But, then this is just a short run phenomena when you have a balance of payment deficit and it is a case of a fixed exchange rate. The central government will start losing reserves because it has to maintain that parity. The reserves which were say R star in the short run will come down and reach a level which is R double star. So, again your back to equilibrium, you were here initially money supply had gone up.

There was excess supply in the money market which is equivalent to saying there is a excess demand in the goods and the bond market. Excess demand would mean balance of payment deficit. Deficit would mean in the fixed exchange rate regime that the reserves will come down. Eventually they will reach a level which is R double star. So, any disequilibrium is a short run phenomena.

Now, you can also visualize a case where L bar d increases remember L bar d which is a function of r y. P is pi P star k P star k constant. Say for example, there is devaluation there is devaluation. So, devaluation of the local currency. So, appreciation of the foreign currency if pi goes up all this is fix, this is fix. This is fixed pi goes up L bar d goes up. L bar d goes up there is now excess demand for money. There is excess demand for money which is equivalent to saying that there is an increase in savings. Increase in saving is equivalent to saying that there is a decline in consumption.

Decline in consumption would mean that there is a decrease in demand for goods. There is decrease in demand for bonds which is equivalent to saying that there is a balance of payment surplus. If there is a balance of payment surplus and it is a fixed exchange rate regime then the central bank would gain reserves.

So, when the central bank gains reserves whatever was the excess demand this would be wiped out. Eventually this will this money market will come to an equilibrium. And so, will be the there will be an equilibrium in the other markets because all markets are inter linked through that walrus law that the sum of the value of the excess demand is equal to 0.

So, if L bar d goes up this line instead of shifting inwardly it will shift out. You were at R star as money as there was devaluation money demand would go up. You will have a balance of payment surplus, but over time reserves would go up and whatever was the excess demand in the money market would be wiped out. Eventually, you will reach an

equilibrium where the reserves would go up to a level where to a level which is R triple star.

So, that is that was the working when you had a fixed exchange rate regime. Now think of a scenario where you have a flexible exchange rate. When you have a flexible exchange rate regime. Can you think what will happen to this equation? This was a case of a fixed exchange rate. Now, you have a case of a flexible exchange rate regime. Now, we are trying to understand what happens what does monetary approach to balance of payment has to say when you have a flexible exchange rate. Can you think what will happen to this R dot term?

There will be (( )).

It will be 0 absolutely because there is no question of having reserves. When you have a flexible exchange rate regime because the any disequilibrium in the case of a flexible exchange rate regime is managed by the changes in the prices of the foreign exchange. So, this is an ideal situation where you have a freely floating exchange rate. There is no question of any country maintaining any reserves of foreign currency. So, R dot would be 0. In that case you would see that the money demand would be equal to the money supply because R dot is 0. So, money demand will always be equal to the money supply.

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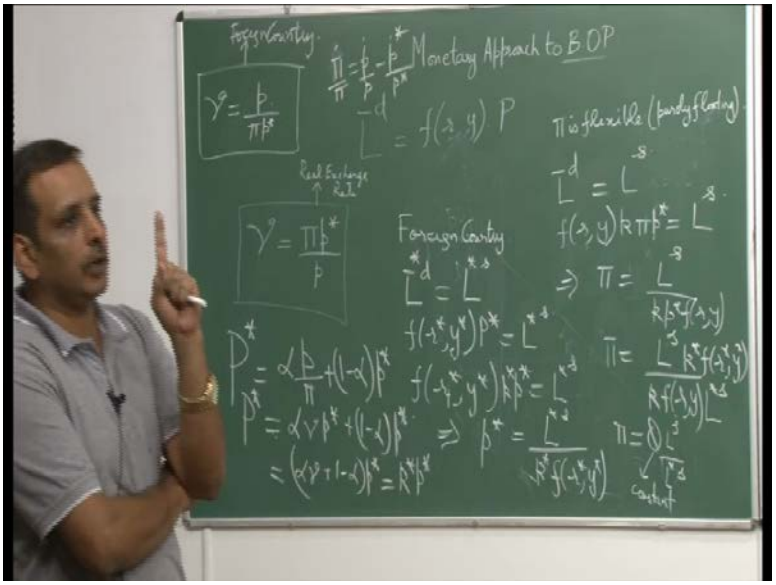

So, then flexible.

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So, pi is flexible. So, money demand is equal to money supply which is f r y k pi P star is equal to L s. So, pi is L s by k P star f R y. I replace the value of P star from the prices which prevail in the foreign country. Now, look at how I have derived P star same way f R star y star P star. This is the money demand function in the foreign country L star s. This is equal to k P star is equal to L star s. P star is L star s k star f r star y star and the prices there is a weighted average of the imported good. The prices of the imported good, there in the foreign country and the price of the domestic good.

So, if you do it you will get k star P star. So, then if you put it here you will get all constant theta constant theta is k star f R star y star k f r y L s L star s L s L star s. What does it mean? If you increase the money supply in the economy and if you just recapitulate the what happens in your economy? If you increase money supply excess supply of money equivalent to excess demand for goods or an excess demand in the bonds market. So, you have a balance of payment deficit and if it is a flexible exchange rate then your currency would, your currency would depreciate or foreign currency would appreciate.

If foreign money supply increases can you think what will happen if foreign money supply increases? There will be in excess supply of money in their market which is equivalent to saying that there is excess demand for goods and bonds in their market. So, they will have a balance of payment.

(( ))

Deficit. They would have a deficit and we will have a surplus. So, when we will have a surplus our currency would appreciate, our currency would appreciate. So, that is why you have an inverse relationship between pi and L star s. Can I repeat this point again? when the their money supply increases think same way that walrus law will hold. So, excess supply of money in their market which is equivalent to saying excess demand for goods and securities in their market.

So, excess demand for goods and securities in their market and this being a flexible exchange rate regime. If you have a balance of payment deficit there is no question of

losing reserves. They their currency would depreciate it is equivalent to our currency would appreciate.

So, this is a function of L s L star s. So, now, please try to recall. Some I think you asked the very first day, what determines the changes in the exchange rates? So, now, here at this moment up till now we have studied at least four factors which determine the changes in the exchange rate. One the open interest parity says that pi hat is a function of the differential interest rates. Remember the open interest parity which is pi hat the is equal to R minus R star.

So, this is the expected rate of change of exchange rate. So, the exchange rate moves because of the differential interest rates. This coming from the open interest parity. Then we studied the P P P theory purchasing power parity theory and if you assume that whatever the monetary approach believes that this is a constant. Then you would see that pi dot or the change in the exchange rate will be e dot by e or pi dot by pi where d pi by pi. This pi dot by pi is d pi by pi. This is d pi by pi; this is equal to P dot by P minus P dot star by P star.

So, this d pi d P by P d P star by P star so, your exchange rate moves because of the differential inflation rates because of the differential interest rates because of the differential money supply because of a factor called delta. Remember delta, delta was when the foreign currency is in forward premium. Here delta was if this was greater than 0. So, pi f minus pi was greater than 0. So, pi f was greater than pi. So, you would buy foreign currency at the spot market and select at a higher rate in the forward markets, but when you buy foreign currency in the spot market. It would lead to depreciation of your currency.

So, then econometrically you have all right hand side variables coming from the theory. So, this exercise you can do it as an exercise for this research work that you need to do. You can consider any country. You can take on the left hand side the exchange rate may be Indian rupee, visa V S D R. S D R is the special drawing right. It is the money of the I M F. This on the left hand side and with the data that I have already sent that C I C database. You have data for all the country.

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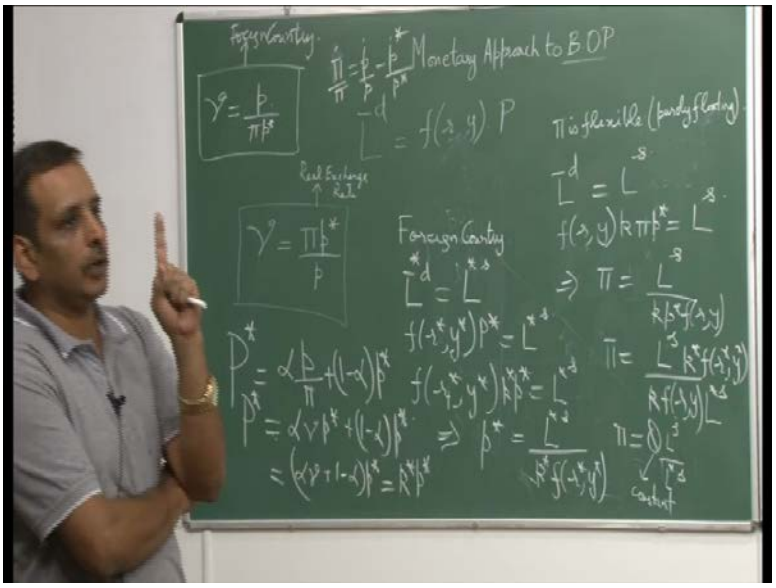

So, you need to take left hand side. You can download it in the excel sheet. Left hand side will be the exchange rate. On the right hand side you can have the differential interest rates. So, you can consider foreign country to be saying U S. If you are working on china then you can consider foreign country to be Japan whatever. So, you can have a differential interest rate you can get data on the differential inflation rate. You can get data on the differential money supply. You can get data on the forward premium delta of the foreign currency.

So, four factors. Then generally when you do this type of thing then you also include say Y star output of prevailing in the foreign country and output G D P of your own country. How is it link to the exchange rate? Well if the foreign G D Ps go up, foreign incomes go up the demand for money goes up because higher the incomes, higher is the demand for money. There is a excess demand for money in their market. So, if you assume that the walrus law holds. So, if there is excess demand for money there has to be an excess supply in the goods and the bond market.

So, it would mean that you would have you would have excess supply. So, you would have surplus in their country. Surplus would mean that they you would see and appreciation of their currency or a depreciation of our currency. Can you can you go over this link again? So.

(( )) deficit in their country because their incomes are increasing there are more demand for (( )).

No.

No.

The link is through this. When their incomes go up it is this in their country which is going up. So, excess demand for money is equivalent to saying that there is excess supply in the goods and the bond market. So, excess supply in the goods and the bond market would mean that their currency would appreciate excess supply. Remember excess supply in their there we have a balance of payment surplus. So, if it is a flexible exchange rate their currency would appreciate our currency would depreciate. Think of another way what happens if this goes up, our incomes go up? If our incomes go up.

(( ))

If our incomes go up the demand for money goes up. There is a excess demand for money there is a excess supply. So, you will see appreciation of our currency or depreciation of the foreign currency. So, it means that if you are taking incomes, this will come and if you have an exchange rate on the left hand side pi on the left side. This will come with the positive sign, this will come as a negative sign. So, it will be again y by y star, y by y star; sorry y star by y y star by y.

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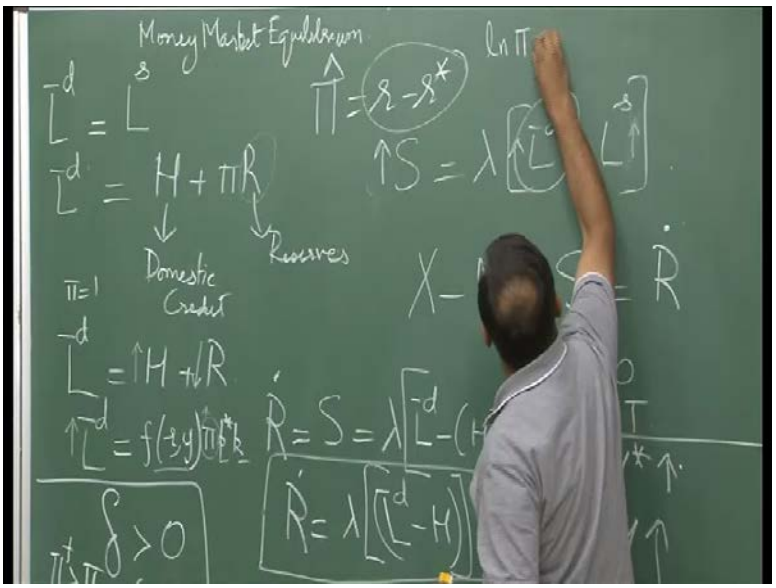

So, then so if you have to put an econometric equation it will be ln pi a constant alpha plus beta log L s by L star s plus gamma log y star by y plus m delta plus R ,sorry q r minus r star plus s p minus p star plus U. And if you want to make it logs you can add on q times log delta, q times log r minus r star, s times log p minus p star. If you recall econometric equation they have these parameters. Each econometric equation will be identified by parameters alpha, beta, gamma, m, q, s.

So, if you want to make all logs where the coefficients will give you the elasticity. You can do this exercise you just have to take this and the logs log y star y. This is not difficult to get G D P data, not difficult to get money supply data, not difficult to get the forward premium. R minus R star interest rates inflation rates and So, this will be the correct specification of this model.

Anyone who takes any factor will lead to incorrect specification because this is what the theory is saying. It is not L star s by L s it is L s by L star s, it is y star by y. Then if you are doing it for India you can also consider because our exchange rate moves because the U S dollar moves. De facto not by law if you do an exercise like this and if you put u s dollars on the right hand side. You will see that U S dollar will have a significant impact on the exchange rate.

If you consider all these variables with U S dollars you will see the role of dollar to have a role of dollar this factor will have a significant impact on the exchange rates. And then when if you work out standardized beta coefficients; that means, make each variable as standardized variables 0 1. Put every factor on the same platform and then compare the relative effects. You will see that that exchange rate U S dollar plays a significant role in what the Indian rupee. how the Indian rupee moves?

So, we do not say that by law that we move according to what U S dollar moves, but, if you do these exercises. You will find it; I mean it is up to you. I mean it is the researchers job to find out what determines India's exchange rate Indian. How does Indian rupee move? Rupee verses S D R. So, when you take that exchange rate it will not be in terms of U S dollars because you are if you put U S dollars here. It has to be in context of something like rupees in terms of U S dollars, but, if you are taking rupee in terms of U S dollars.

You cannot take U S dollars here; you have to take U S dollar in context of S D R. Indian rupee in context of S D R special drawing rights that is the I M F money.

So, then you can put U S dollars, you can put Japanese yen, you can put euro, Australian dollar, Japanese yen, Chinese Renminbi. You can have all these factors and you can have these factors and then it will be an interesting exercise. Do it you will get an equation which you can also use for forecasting. What will be the value of Indian rupee after a years time? So, you can put the values of the right hand side variables in that regression equation and you can estimate what will be the exchange rate after say a month or a year and so on.

Sir.

When your incomes are increasing, we are saying the savings are increasing throughout the money demand.

No. When we say that the incomes are increasing, we are relating it to the money demand.

And say the savings are up.

The savings go up.

And so we have a balance of savings.

By payment surplus.

Yes sir just because of consumption.

Consumption goes down.

But that happens only if it is a relative increase in savings because when income increases consumptions also increase.

Yes.

So, if consumptions are increasing then balance of payment deficit would come into picture now (( ))

No. So,

Both the things are acting in (( ))

See when we are talking of this monetary approach to balance of payments. When we say that the savings go up and the consumption goes down. We are saying that c plus s is equal to y is not it. So, when savings go up. It is the same argument that in the Keynesian model remember the savings paradox. What was that savings paradox in the Keynesian model? If the savings goes up instead of income going up the income goes down. This is a question which was regularly asked when you were discussing the Keynesian model. Reason being that in the Keynesian model if the savings goes up the consumption goes down, the aggregate demand goes down. It pulls down the income through the multiplier. That was the famous savings paradox, this is all coming from there only is that Keynesian model is an extension of what they have been saying that increase in savings.

But then (( ))

Reduces income, but the fact is that we are trying to relate incomes with savings. So, the relation here in the monetary approach is that incomes tend to have an impact on the money demand.

(( )) monetary (( ))

And money demand tends to have an impact on the savings. So, the consumption goes down. So, what is your question then?

(( )) they can so have the other effect that the opposite effect that increase in incomes can also lead to increase in consumption.

Which needs to a balance of payment deficit instead of surplus? So, it is are elative effect that we got it downward.

So, in the monetary approach this. This is the equation it is not relating anything with the with the consumption. So, if you would recall the how we got this equation? Y was equal to C plus I plus G minus T G plus X minus M. This was assumed to be 0 in this approach and this was C plus S plus T is equal to C plus I plus G plus X minus M this was 0. This was equal to this C and C cancels. So, you get C is equal to X minus M.

So, any current account surplus was a function of savings only. So, it is based on very stringent assumptions this monetary approach. So, when we come to the next chapter that is the asset market approach. We will see some flexibility. It will be more refined output will not be at full employment level. Prices will not be a function of the exchange rates. All markets would be interlinked. You will see all these changes coming up in the next approach. So, this is very stringent it has this equation only. So, it is this linkage which works here, but that is how the asset market approach came in because people started questioning that it is based on very stringent assumptions.

So, when we come and discuss the portfolio balance approach you will see that you will have a portfolio where you will have money, you will have domestic bonds, you will have foreign bonds. You will see that there will be savings; you will see that you will have a wealth. Wealth is income from all sources whether productive, nonproductive and then all sort of equations which will change. So, it will be a mix of everything it will be more nearer to the reality rather than based on all these assumptions

Implications of Dornbusch model are also similar (( ))

(( ))

That is interesting I glad that you reminded me. Remember the when we were discussing the Dornbusch model. We discussed that the story does not end when you increase the money supply and it is a flexible exchange rate. And then we had said that if you the story does not end. If you assume that the prices are flexible, if prices are not flexible remember you when you increase money supply what happens L M curve shifts to the right R goes down incomes go up.

So, imports go up balance there is a balance of payment deficit. If there is a balance of payment deficit and it is a flexible exchange rate L m curve shifts to the right, but when there is a balance of payment deficit the I s curve shifts to the right also. So, monetary policy is completely effective in the case of flexible exchange rate with fixed prices.

But, when you have flexible prices see what happens? When you have flexible prices look at m by P ratio. M has gone up, but now prices start increasing. When the prices start increasing the L m curve shifts to the shifts slowly shifts start shifting to the left. You will see an appreciation of the currency. So, that when you had increase the money

supply the exchange rate had over shot its target, but because of the appreciation it comes back to its equilibrium.

Now, that you can think even in the Mundell-Fleming framework that, but then you have to add on that the prices are flexible. Now, if you want to bring in the same thing in this approach. Then you have to concentrate on this particular equation or this one which is pi P star by p.

So, say for example, again think that in this monetary approach to balance of payment money supply goes up. So, if the money supply goes up interest rates go down incomes go up. If incomes go up there is a balance of payment deficit. If there is a balance of payment deficit and it is a flexible exchange rate this goes up, but, now please think that please see that this is astringent assumption that this is a constant. If this is a constant then something has to happen in this model. Can you tell me what will be that something which will happen which will make it constant?

(( ))

The prices will go up and remember in the Mundell-Fleming framework. I deliberately made an assumption saying that the prices were first constant and then they change. Here it you see pi changing you see P changing. So, this does not change, real exchange rate does not change. So, then that money supply which increased you do not see any change in the I s curve in the monetary approach. Only when the prices go up the L m curve which shifted to the right will come back to it is equilibrium position.

There will be no shift in the I s curve. So, that is the difference between the final results are the same, but, the approach is little different because here they relate to the P P P. So, I am glad that you question me on that. So, we will end up here and we will see a more refined model on the asset market approach to balance of payment. And that is also called the portfolio balance approach to the balance of payments.