International Finance
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Lecture - 13
Exchange Rate Determination and Forecasting

Hello, let us discuss in session thirteen, the Exchange Rate Determination and Forecasting. In this session, we will be discussing about various theories of exchange rate and how the theories along with different parameters determine the exchange rate, and how we can use this parameter in forecasting exchange rate. If you if you remember in our earlier section, we have discussed interest rate parity hypothesis, we have discussed the forward premium, inflation, interest rate, all variables linked together and determining a complex process where exchange rate can be forecasted, and this variable in a systematic way describe about the near future exchange rate. We will be using this variable along with various other macroeconomic parameters to forecast exchange rate, and also we will be discussing about the relevant theories of forecasting of exchange rate.

The theories here: primarily, the asset market theories, the interest rate parity hypothesis theory, and also the monetary approach to interest rate modelling side.

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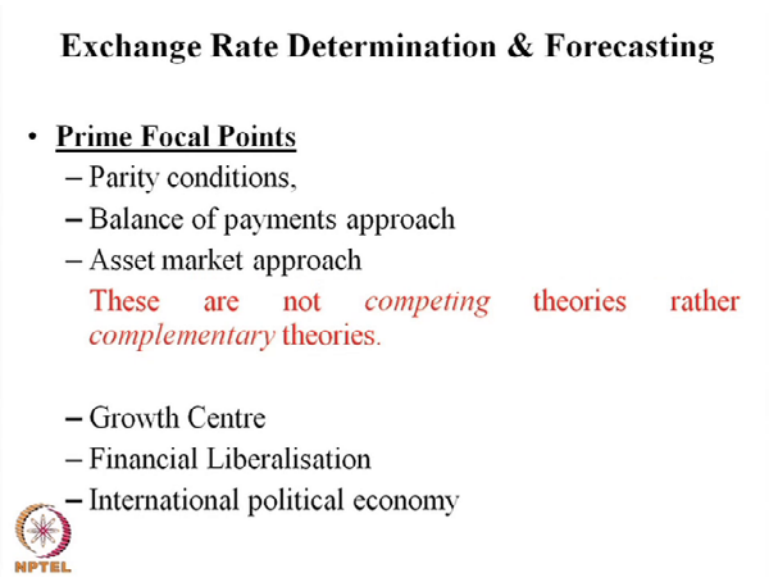

Let us start with the focal point of discussion of exchange rate. Here the prime focal points are: parity conditions, the balance of payment approach and asset market approach. These are some competing theories, but they are complimentary to each other; rather, we can use the word complimentary not competing. In parity condition, we have discussed the interest rate parity, the inflation parity and how interest rate along with inflation determines the near spot, near future spot rate.

We will be further analysing this concept in the balance of payment approach. We know the export import, the inflow outflow of a foreign exchange determine the demand and supply condition of foreign exchange. And along with the domestic currency, the inflow outflow of foreign currency determines the value of the currency. The balance of payment is the starting point of demand and supply side. In export import, current account side that is export import invisible inflow outflow determine the current account deficit or current account surplus along with along with what is called the large long run inflow outflow. Particularly, the particularly your capital inflow, gold import, gold export, capital inflow, FDIFI, they determine the capital account convertibility side and capital account deficit or surplus side. along with the current account deficit and surplus and capital account deficit and surplus determine the level of demand and supply of foreign currency in a domestic economy.

Here, the demand is more, supply is less. It leads to depreciation of the currency and finally reflects a positive or negative side of current account deficit which may pull the exchange rate in pull the exchange rate exchange rate either towards depreciation side or towards appreciation side.

Asset market approach: we consider the foreign exchange as a asset and people demand the foreign exchange for investment side and this asset market approach also helps in determining the foreign exchange rate or some extent help in forecasting the near future foreign exchange rate.

These are basic focal points, focal theories of fundamental theories of what is called interest rate determination, exchange rate determination and this theory we cannot mention them, I cannot consider them, as a computing theory because not a single theory will be in a position to forecast the exchange rate in actual manner. So, rather we can we can we can consider this theory as complimentary to each other and describe the near

future, for near future spot exchange rate in a systematic way, another side also; the real market side; real market, take particularly our real demand and supply of foreign currency. Here, we can mention about the growth centre.

Growth centre means there are many emerging economies are there; they are the growth centre in a in a in the world economy. This economy demands more foreign currency because their because they are growth centre do not need foreign capital foreign capital or foreign investment for the development of their economy and towards this country or to foreign exchange either in the form of portfolio investment or in the form of foreign direct investment inflowing. And this large scale inflow of foreign currency to this emerging economy particularly India, China, Brazil -these are the emerging economy where the demand and supply of foreign currency though very high, the supply deficiency may sometime create some kind of depreciation of foreign exchange rate. Also, at the same time, they have large scale inflow of foreign currency which may sometime influence or appreciate the domestic currency and create some kind of problematic aspect to this country.

So, we can use, to some extent, real sector phenomenon to describe the foreign exchange determination. At the same time, financial liberalisation after 1970s or early 80s,many countries realize their economy; particularly, the emerging market economy. They liberalise their economy. They liberalised in the economic in the sense that they open up their economy they and they allow the export import foreign capital, foreign capital foreign inflow towards their own economy. And this liberalisation helps to some extent inflow outflow of foreign currency and lead which lead to depreciation or appreciation of foreign currency.

So, international financial liberalisation or integrating the domestic economy with the world financial system some extent also influences the appreciation or depreciation of domestic currency. Similarly, political instability, political sovereign risk political instability, stability of the some extent also influence the foreign exchange inflow outflow which may be considered as a parameter for the determination of exchange rate.

Let us discuss about the various theory in the systematic way so as to articulate how this theory can contribute in in explaining the foreign exchange rate determination or exchange rate forecasting side.

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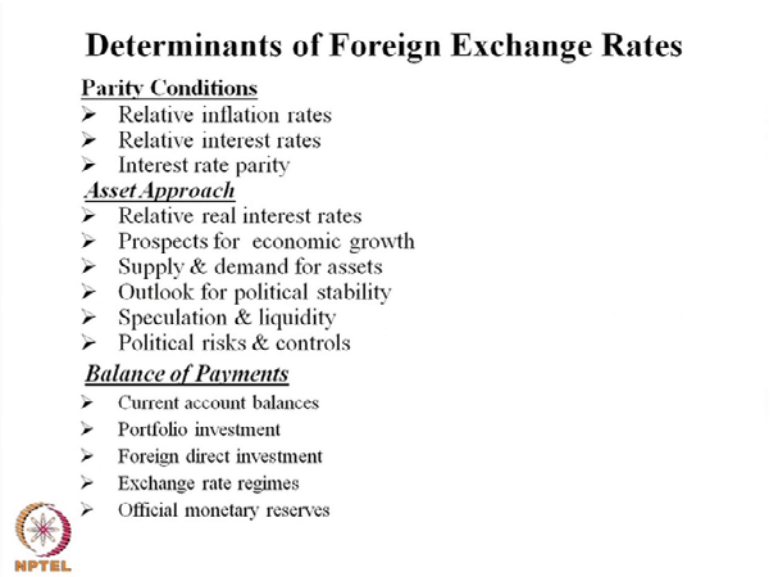

So, here determinant of foreign exchange rate, particularly the parity condition we will be discussing and asset market approach we will be discussing. Also, we will be discussing about the balance of payment in details.

In the parity condition: So, we understand the parity means here interest rate parity. Parity means here inflation side parity may be because of because of difference of people. So, it may happen that inflation in a particular country is very high. So, real interest rate may depreciate, real interest rate may come down and this may lead to outflow of foreign currency because when the interest rate, interest is differential, it is a source or determinant of foreign currency inflow outflow. In our interest rate parity hypothesis, we have discussed how interest rate between two countries create interest rate differential which lead to lead to outflow or inflow of foreign currency.

Here, we will be discussing about suppose Indian interest rate and US interest rate, here we can our last class we have discussed in our session 12. We have discussed about interest rate parity hypothesis in a systematic way.

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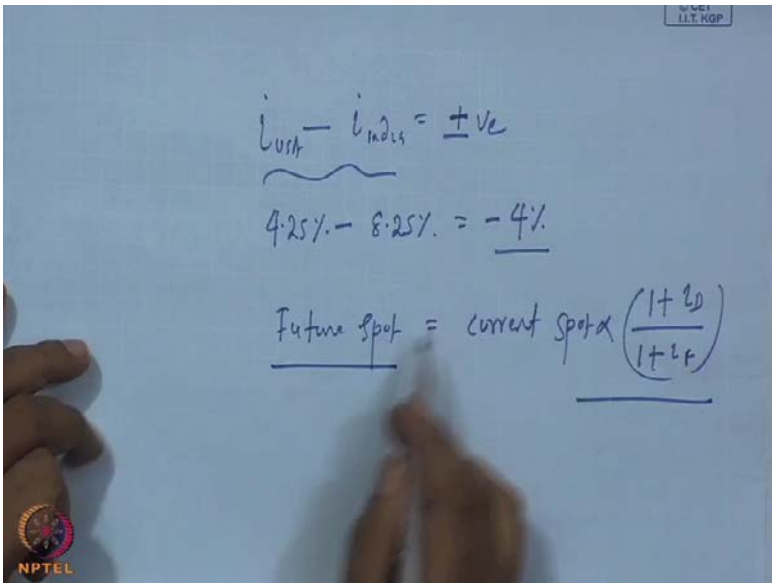

Suppose, interest rate differential in US minus interest rate in India, there exist some differential, because here it may be positive or may be negative. So, it may be anything; positive or negative. Suppose interest rate in US is 4.25 percentage and interest rate in India is 8.25 percentage, there exists a differential of 4 percent. This 4 percent differential, because Indian interest rate is high, it lead to inflow of foreign currency; particularly US dollar to Indian economy. Why it is why it is, so because Indian economy is in investment side now, because the Indian economy is giving more interest rate. So, interest rate differential create some kind of impulse in the inflow of dollar to a particular country.

We have discussed that in earlier classes, the future spot. Future spot is nothing but current spot, current spot into 1 plus 1 plus domestic interest rate divided by 1 plus foreign interest rate. We have discussed this phenomenon last earlier classes that if you want to forecast the near future interest rate, the near future interest rate, primarily influenced by interest rate parity; interest rate parity means the parity. If there is no parity in interest rate, that means there is a differential between two country interest rates.

The differential creates an impulse, creates a force for the inflow of dollar or inflow of foreign currency to a country where interest rate is higher. This interest rate arbitrage creates some kind of arbitrage profit and this leads to the flow of the foreign currency to

a domestic economy. So, generally in India, interest rate is higher than US united states and there is a flow of dollar to India, because India to be considered as a investment market. So, this interest rate differential is some extent influence the exchange rate inflow outflow. We have discussed in earlier classes that interest rate parity hypothesis. There are three different kind of parity hypothesis that we have discussed: the first parity hypothesis parity.

Why parity exist? The parity exists because parity is supposed to be existed in real market because the traders in foreign currency are same. They are also playing in US market. Same players are there in Indian market. When they see interest rate arbitrage available in India, in US they buy. If the interest rate is higher in India, they invest in India by borrowing dollar from US and in this process, they get the arbitrage. So, as long as arbitrage opportunity available in interest rate differential, there will be inflow outflow of dollar. So, arbitrage opportunity sometime may be considered as a determinant of exchange rate.

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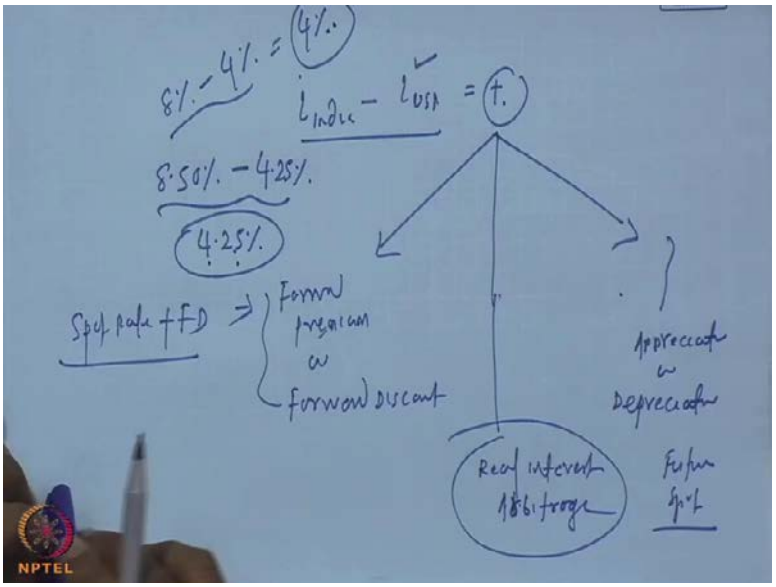

So, we have discussed last class that earlier session say interest rate in India minus interest rate in US that is domestic minus foreign interest rate, if it is positive it will lead to two three different kind of theories. First theory is this interest rate may lead to what is called forward premium; forward premium or discount or forward discount; it may lead to what is called appreciation or depreciation of domestic currency and third is that if this

may happen in what is called a real interest rate arbitrage real interest arbitrage. So, this forward market because even when there is a when there is a differential interest which is positive, the differential interest rate adjusted in forward premium or forward discount. If the interest rate is differential interest rate is positive, the currency - domestic currency will depreciate or domestic the domestic currency will be a forward discount currency. And here, in the spot rate you have to add the forward discount.

So, here this way spot rate you have to adjust the forward discount. This theory is telling that second theory is called the if the interest rate is positive it may happen that the trader will buy, trader will borrow from US market in dollar, convert the dollar into Indian rupee and get higher interest rate in Indian rupee, and this way there will be more flow of dollar to Indian economy. When more dollars are flowing to Indian economy, the dollar will be converted into Indian rupee; there will be more circulation of Indian rupee in the economy; this leads to depreciation of Indian currency and the depreciation adjusted in the future spot rate future spot rate.

So, currency will be depreciated; dollar will be appreciating; currency rupee will be depreciating currency; these two are adjusted here. Similarly, because we are not factor the inflation here because these interest rates are nominal interest rate, here we are not factoring the inflation. We discussed in the earlier session, nominal interest rate minus inflation; it is the real interest rate. It may happen the difference in nominal interest may interest rate is available because inflation in India is very high compared to US. So, if you factor the factor the inflation rate, it may happen that this gap between India and US interest rate will be reduced further because the inflation in India is higher than the inflation in US. And this way this way we are discussing about real interest rate arbitrage.

Real interest rate arbitrage between India and US is quite low because if you at present consider Indian interest rate something around 8.5 percentage and US interest rate something around 4.25 percentage, the differential is 4.25 percentage. This 4.25 percentage rate is real nominal interest rate. However, if inflation in India is something around 8 percent and US inflation is something around 4 percent, the difference in inflation is 4 percent; so, 4. Nominal interest rate differential is 4.25; real interest rate difference is 4; so, inflation differential is 4. So, actual real interest rate differential is 4.25 minus 4 is nothing but only 0.25 percent. The real interest rate arbitrage is very low

if you adjust the inflation between two countries and actually you have to factor the inflation whenever you are considering something around more than 6 month period of forecasting. Short term forecasting may not be may not be required, while long run forecasting you have to adjust the inflation differential also.

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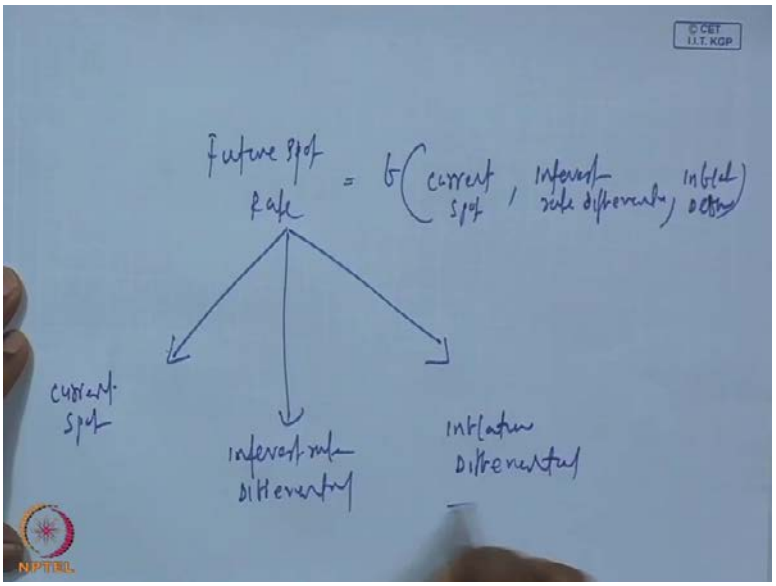

The interest rate parity hypothesis explains towards that the future spot rate, is a function of current spot, interest rate differential and inflation differential. So, what does it mean? The future spot rate has a primarily three aspects taken into account to determine the future spot rate. You have to take into account for future spot rate for forecasting the current spot; you have to take into account the interest rate differential and also the inflation differential.

So, the current spot interest rate differential and inflation differential may give some kind of some kind of some kind of prediction, some kind of near future prediction about the future spot rate. These are primary thing interest rate differential take into account and the interest rate parity hypothesis addresses these three concepts: the current spot, the interest rate differential and inflation differential to determine as the future spot rate. So, primary determinant for future spot rates are current spot interest rate differential and inflation differential that we came to know from the interest rate parity hypothesis.

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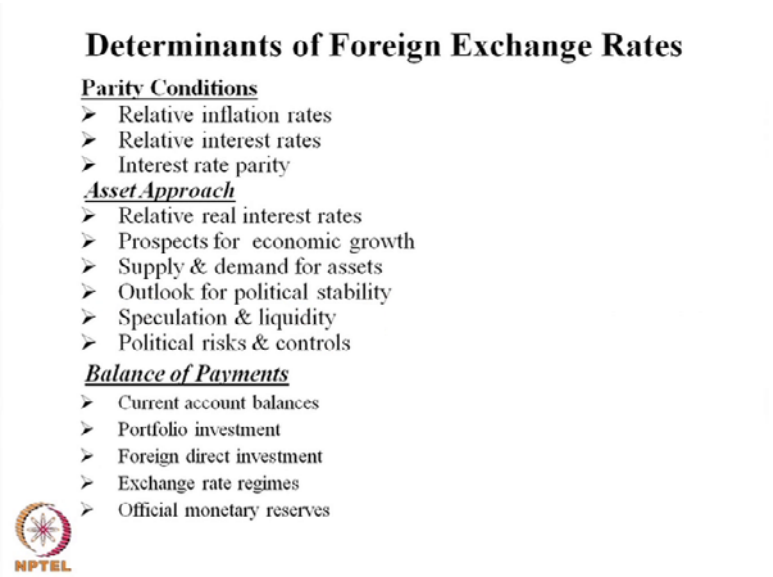

So, inflation in parity hypothesis primarily discuss the inflation rate, the relative interest rate, interest rate parity. These three aspects take into for interest rate parity condition which provides some kind of basic or fundamental aspect for the prediction of exchange rate. Third, this parity condition we have discussed. The second aspect is here; asset market approach. Asset is here because when you consider asset market approach, the primary variable also here - the interest rate.

The prospect for the growth asset market: If the market is growing, there is a prospect for the growth. So, it may happen that there will be more flow of dollar, of more flow of foreign currency (( )) or economy and that economy is expanding. So, it may, that economy may need, demand, more dollar and domestic currency may depreciate. In that aspect, asset market approach, to some extent some extent the growth parameter also influence the demand and supply condition of the foreign exchange and needs also some extent near determinant of foreign exchange rate. The supply and demand for asset: Suppose the dollar is more demand, there is dollar US dollar is more demand; so, supply there will be since supply is less, the US dollar may appreciate and against the Indian rupee, the rupee may depreciate.

Similarly, outlook for political stability: also suppose the asset market, asset market the growth in the asset market is also influenced by the demand and supply condition and

also political stability of the country. Sovereign risk political stability also influences the exchange rate.

The speculation liquidity: speculation and liquidity speculation means some extent the speculators also determine or influence the exchange rate for short, very short run; long run may not influence, but short run, the liquidity, the demand and supply condition, the speculation also influence the exchange rate.

The political risk and control aspect: the political risk means there is a political instability control aspect; the economy is not liberalised economy. Some extent controls are there in balance of payment, movement of inflow outflow of dollar of foreign currency also influence the exchange rate.

The balance of payment side some another theory, last theory we have discussed about these the balance of payment, the current account balance. Current account is primarily export import invisible. They decide the current account deficit or surplus. Emerging economy particularly Indian economy, always the exports imports are more than the export. So, current account deficit always there, however invisible inflow outflow; particularly the NRI investment. NRI inflow outflow dollars are there. This some extent gives some current account surplus.

However, invariably, Indian economy we have current account deficit. A current account deficit indicates there our exports are not in a position to pay for our import. Our invisibles are not sufficient to pay; remove the current account deficit. So, there is a current account deficit always there.

Portfolio investment: Particularly, they liberalise the economy when the foreigners are allowed to invest in domestic economy, particular debt market or the equity market there will be more portfolio investment; there will be more inflow of foreign institutional investment. We also help also help in bringing foreign currency domestic economy that also influences the determinant of exchange rate.

Third foreign direct investment: The economy is liberalised; different sectors are opened up. Then foreigner foreigners are allowed to participate in domestic development. That foreign direct investment also contributes to contribute to appreciation or depreciation of foreign currency and then domestic currency.

The exchange rate regime: Another aspect of the exchange rate which exchange rate we are we are we are describing or we are opening whether our economy is a more floating exchange rate system or fixed exchange rate system or our central bank, particularly are in are in determining the exchange rate which regime which regime is which exchange rate regime we are operating.

In a floating exchange rate regime where the intervention on the part of the central bank is very less, that may create some kind of speculation in domestic currency and also allow the more foreign institutional investment to the economy. It is the fixed exchange rate regime; the exchange rate is not market determined; also to some extent influence the exchange, the determination of the exchange rate system. So, a regime of foreign exchange rate exchange rate system some extent influence the exchange rate determination process.

The most important - official monetary reserve: We have significant official reserve. Our foreign currency reserves are significant. They also give stability to the stability or increase our foreign sovereign rating and this also influence the influence the exchange rate determination process. So, India some of many emerging economy have significant amount of foreign currency reserve. This give stability to foreign exchange, foreign exchange market and also help in increasing the sovereign rating, which in turn influence the foreign institutional investment, foreign direct investment and foreign capital inflow to the domestic economy. These are balance of payment side. We will be discussing separately each aspect.

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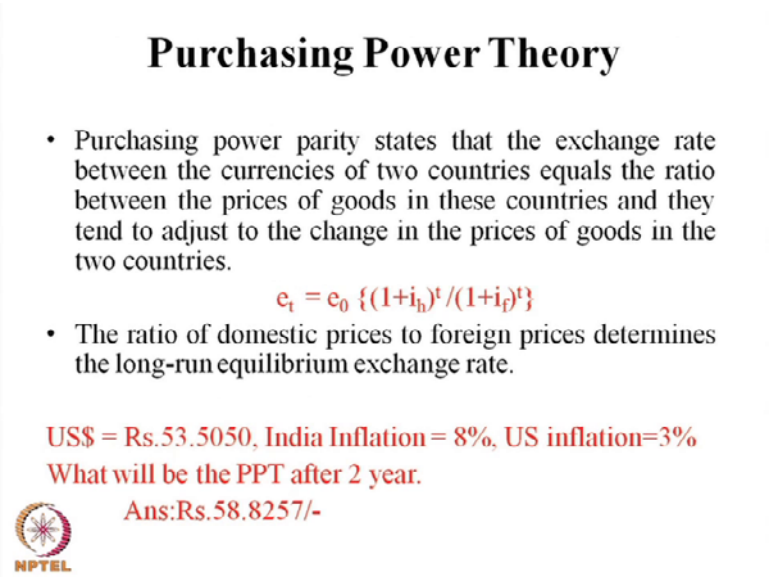

However, in this process, let us discuss with the purchasing power parity theory. Purchasing power parity theory, as you know, is a long term phenomenon or the movement of exchange rate. We have discussed the purchasing power parity theory earlier section .Purchasing power parity theory considers exchange foreign exchange as a power to purchase goods or the relative power to purchase goods. Relative powers means a currency at which the US dollar or Indian rupee, which is how what powers or value they are having, the intrinsic value because the purchasing power parity theory determines the exchange rate in a long run because it gives some kind of clue or some kind of some kind of value to the exchange rate system.

We have discussed about purchasing power parity theory. Earlier classes, we have mentioned that if a internationally traded commodity, a basket of commodity when you purchase from different country, what rate we pay that is that rate determines the exchange rate of international currency because we have to find out a basket of internationally tradable goods and try to purchase these goods in different country.

On the basis of the money you pay in different country that will exchange that will create some kind of exchange rate system. So, purchasing power parity theory provides us the intrinsic value of domestic currency, the power of domestic currency and the purchasing power parity theory determines what is the long run interest rate, long run exchange rate movements of the country.

So, purchasing power parity theory is the basic aspect of the basic aspect of aspect of interest rate parity or the parity hypothesis. Here, purchasing powers are being are being equalised in different countries. So, purchasing power parity theory gives us what kind of formula, some kind of formula to us to determine the long run exchange rate in economy.

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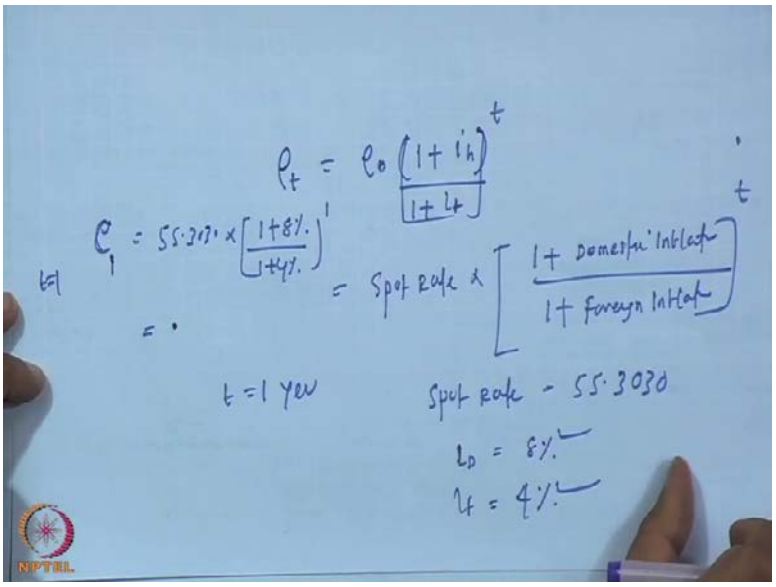

Purchasing power parity exchange rate at time period t is nothing but exchange rate at the spot market into 1 plus the interest rate in the your the price you are using I. You are using I. You are using the domestic price. Domestic price divided by I plus international price foreign price to the power t; In other words, currency exchange rate at time period t is nothing but spot exchange rate, spot rateinto1plus domestic inflation domestic inflation domestic inflation here domestic inflation rate divided by 1 plus foreign inflation rate to the power t. If suppose t is 1 year then current spot rate is something around 55.3030 and domestic inflation domestic inflation I D; I put here ID is 8 percent and foreign inflation I put 4 percent; then you can calculate the exchange after 1 year. What will be the exchange rate between two countries?

So, here you have to calculate what is that... After 1 year, the rate will be e is equal to… after 1 year time period t is equal to 1. So, e 1 is equal to current spot is 55.3030 into 1 plus domestic inflation is8 percent here;8 percent foreign inflation is 4 percent here;1 plus 4 percent; here 1 power 1; this will give us after 1 year what will be the equilibrium

exchange rate between US dollar and Indian rupee because the inflation in India is 8 percent and inflation in US is 4 percent.

What does it mean here? Where because whenever domestic inflation is higher than the foreign inflation, the domestic money, domestic supply of money will be higher and this lead to what is called depreciation of domestic currency. The purchasing power parity theory tries to equalise the purchasing power or the inflation differential between two countries. So, when we use the purchasing power here, we indirectly you are estimating the inflation rate. If inflation in India is higher than inflation in US, then Indian rupee will depreciate against Indian against US dollar. That is the fundamentals; fundamental principle of purchasing power parity theory. Here, parity you are mentioning about purchase power or the inflation rate.

So, suppose in example here US dollar is 53.50, Indian inflation is 8 percent; US inflation is 3 percent; what will be the PPT after 2 years; Purchasing power parity rate after 2 years?

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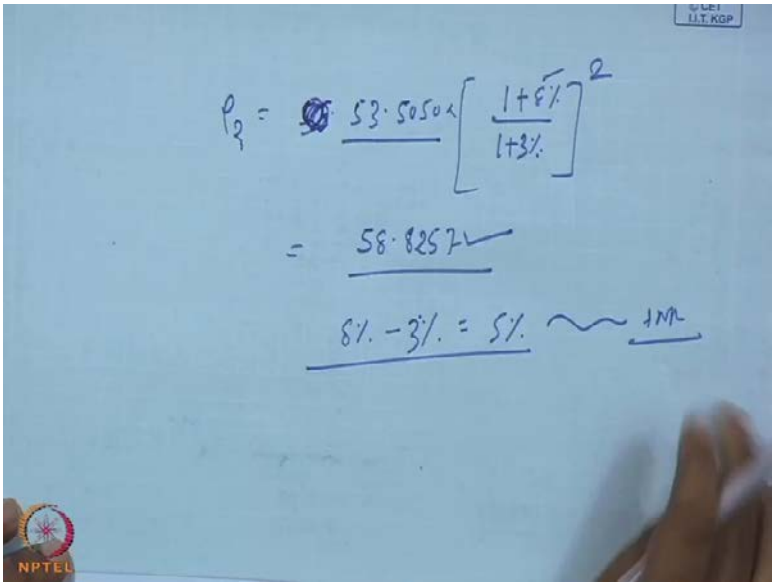

So, here same thing we have. After 2 years, e 2 will be current spot. Current spot is current spot is 55. 50 (( )) current spot is 53.5050. Indian inflation is 8 percent, US inflation is 3 percent and we want to know the equilibrium exchange after 2 years to the power 2. That will give you after 2 year what is the purchasing power parity rate;

purchasing power parity rate. If you solve this, it will give us something around, after 2 years, rupee will be depreciating to 58. 8257.

So, after 2 years, if inflation continues in India at 8 percent, inflation continues in US at 3 percent and if the current spot is 53.5050, rupee after 2 years will be 58.8257. That is the rate of depreciation of rupees here. Inflation in India 8 percent and US inflation 3 percent; this 5 percent differential inflation lead to depreciation of Indian rupee, depreciation of INR depreciation of INR or Indian rupee. So, this is purchasing power parity theory, the basic or fundamental aspect of exchange rate determination.

This is generally used for the long run forecasting of exchange rate; a long run; it is not the interest rate; it is the inflation. It gets adjusted in the supply and demand of currency and there will be depreciation appreciation of currency depending upon the level of inflation in a two economy. So, purchasing power parity theory is fundamental aspect of fundamental aspect of what is called the exchange rate determination in the long run.

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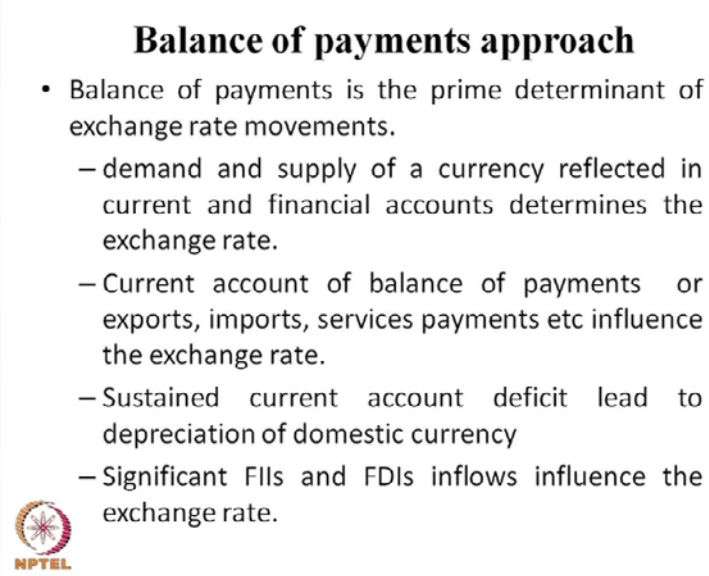

In the balance of payment approach, we have discussed about in detail about the balance of payment. Balance of payment approach primarily determines the inflow out flow of foreign currency on the basis of two aspects. The balance of payment, we when you consider balance of payment of a country we have two aspect. Balance of payment BOP has two aspects.

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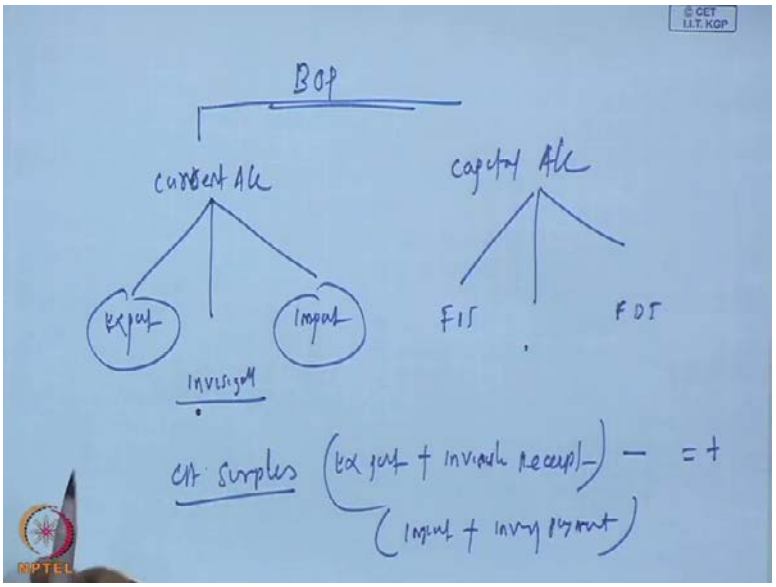

What is called, one aspect is called current account; another aspect is called capital account. In current account, we have primarily export import export import and also we have invisible inflow outflow.

In capital account, we have FII investment, FII FDI and long term capital again; long term inflow of outflow of gold other things are there. So, this here a current account is day to day transaction of foreign currency. Here, the supply and demand aspect of export imports is there. Countries more export imports are exports are more than import we have current account. Current account surplus and export are export plus invisible receipt minus import plus invisible payments. These two we have positive. If these two are positive, then we have current account surplus. Current account surplus occurs when exports are more than import and invisible payments are receipts are more than invisible payment when we have current account surplus. Current account surplus means we have more dollar; more foreign currency, then you are then we then we demand.

So, this leads to appreciation of domestic currency and in emerging economy like India always our exports are less than import; we have current account deficit. So, we are our currency is depreciating rupee against dollar is depreciating. Similarly, similarly in capital account we have FII investment FDI investment, some kind of foreign currency inflow in the long run; so, JDR, ADRs are there which are inflow of foreign currency into India. And this inflow of foreign currency, suppose FII is a surplus, net net FII is

positive; net FDI is positive; we have net long run inflows are positive; then we have capital account; capital account surplus we have.

In capital account surplus, capital account surplus sometime help in appreciating the domestic currency; means, it depends upon the liberalisation aspect. Capital account capital account particularly depends upon the financial liberalisation or foreign currency; foreign exchange liberalisation. In capital account only possibilities are there. Whenever we have, when we have good policy or FDI, FDIs are allowed FIIs are allowed to invest in India. The long term inflows of currency will be there. It depends upon the financial liberalisation of a country.

Here, same thing I mention here. Demand and supply of foreign currency is reflected in current account and financial account determines the exchange rate because the financial liberalisation some extent determine major determinant of foreign exchange rate. So, here, in India if you see, we have current account liberalisation completely. Our export import rates are market determined. We have significant amount of liberalisation in invisible aspect is payment receipt of foreign currency, but in the capital account to some extent we are control; however, significant liberalisation has been done in the FDI,FII investment. Portfolio investments are allowed in India significantly and this also help in inflow of foreign currency to India. So, same thing I have to mention here. Current account of balance of payment or the exports imports services payment, services payment etcetera influence the exchange rate influence the exchange rate.

Similarly, sustained current account deficit leads to depreciation of domestic currency sustained. When continuously our imports are more than export, our invisible receipts are less than our invisible payment, then they sustain current account deficit may lead to depreciation of domestic currency. Similarly, significant FII FDI inflow also influences the exchange rate. Since we have significant FII and FDI inflow, we have a we have significant amount of foreign currency reserve in India which generally influence our, give a stability to our foreign currency market and this may some extent help in influencing the conversion of rupee into foreign currency. And that also provide stability to our foreign exchange market and some extent the capital account have a significant impact on the foreign currency exchange rate determination process.

So, balance of payment what you understand here? The balance of payment is determines the supply and demand of foreign currency. The supply and demand of foreign currency come from the current account side. Current account we have export import. They determine the foreign currency movement, a day to day basis.

On the other hand, we have capital account capital account determine the particularly the FII investment portfolio side. The FII generally invest in stock market, in domestic in your debt market. Their presence in domestic market some extent also helps in giving stability to exchange rate system in a particular country. Long run inflow of foreign currency in the form of FDI, in the form of foreign FII investment also leads to appreciation of domestic currency. And whenever there is a sustained current account deficit is there, there will be a depreciation of domestic currency and this balance of payment, the variables of balance of payment, that is current account deficit with the current account surplus, capital account deficit, the capital account surplus together provide some kind of environment which can influence the exchange rate system in a country and these are the primary variable in demand and supply aspect of foreign currency and in determining the exchange rate in a domestic economy.

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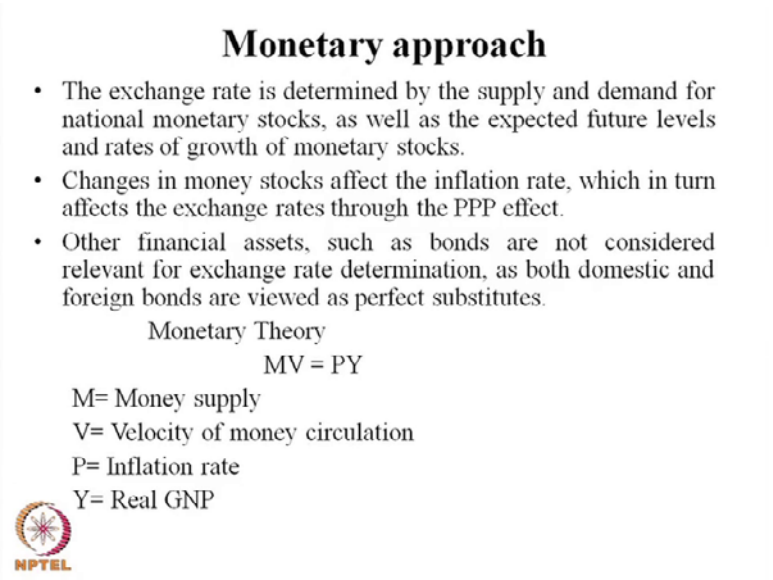

Monetary approach: Here, we have to understand the monetary side of the economy. Monetary approach means whenever, when exchange rate when foreign currency is supplied to a domestic economy, the foreign currency converted into domestic money,

the domestic circulation of money increases. So, when domestic circulation of money increases that mean there will be more inflation in the economy, if there is no control on the part of central bank. Then, when inflation is more as compared to the US dollar, compared to US dollar US or any other foreign country, then it leads to depreciation of domestic currency.

So, the approach is here, the money supply or the monetary approach here, money supply in economy influence the interest rate; interest rate in turn influences the inflow outflow of dollar. Second aspect is money supply, more money supply may create inflation in a economy; inflation in turns may also influence the demand and appreciation or deprecation of domestic currency. Here, we understand the classical phenomenon of monetary approach.

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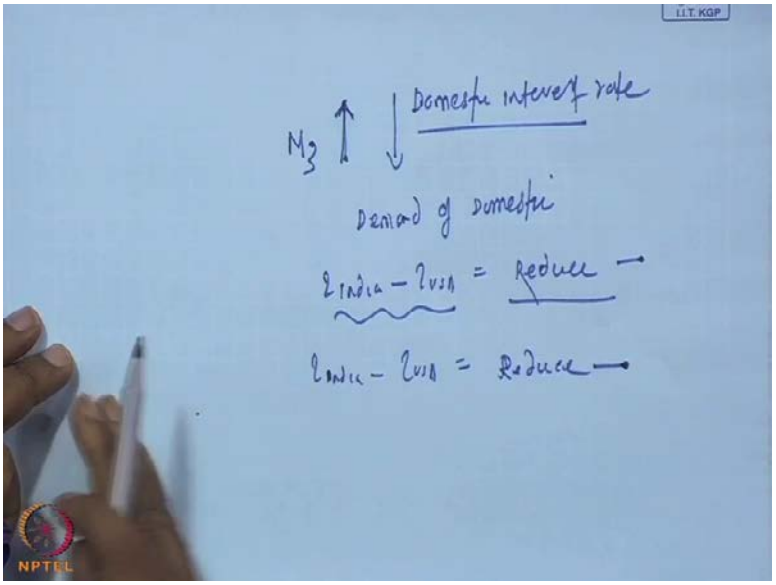

The classical phenomenon of monetary approach is that when money supply that is particularly you call broad money supply M 3, money supply is increases, how to increase the money supply? Well, money supply is two way: first is you have to supply more money by reducing the interest rate; domestic interest rate, you have to reduce. When domestic interest rate is reduced, there will be more demand of demand of money will be there. There will be more demand of domestic money because there will be more credit in the economy. Credit leads to supply of more domestic currency in the economy.

So, when domestic economy is expanding, there will be… it requires more supply of money. More supply of money possibilities are there.

Creation of demand: How to create more demand? You have to reduce the interest rate. When interest rate is reduced, there will be more supply of money in the economy; domestic money in the economy. So, this leads to what is called decline of interest rate differential. Interest rate differential between India and US were declined may reduce; may reduce because when the domestic interest rate is declined, the differential available in domestic in between two countries that is India and US here, they reduce; the inflow of dollar to domestic economy may reduce. The domestic economy in inflow of dollar reduce the conversion of dollar into money; that is a part of the money supply because of foreign currency foreign currencies are coming to India, that may decline. So, there will be deduction of inflation in the economy.

Also possibilities are there that this inflation differential will increase. Inflation differential may inflation differential between India and US may reduce also. This lead to here the nominal interest rate may decline, but real interest rate may increase, real interest rate may increase. This may also create some kind of room for the movement for the inflow of foreign currency to India.

So, what do we understand? What we our take out form here is that domestic money supply some extent creates some kind of room for the determination of exchange rate. The domestic money supply, there is more supply of money in the economy. It is occurring because of demand in the economy. The interest rate may come down and interest rate when comes down, there will be more demand of supply of money in the economy. When supply of money is more, it may create inflation but since interest rate differential are reduced here, there will be more room for the movement foreign currency inflow to the economy.

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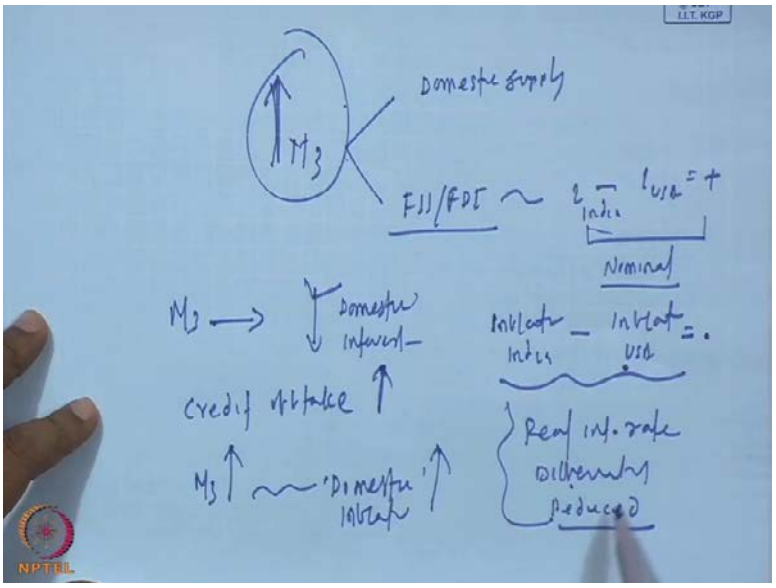

You have to understand here two aspects: Here, the M3, M3 has two aspects: first aspect is domestic money supply; another part of M3 is contributed by FII or FDI inflow. So, when FII FDIs are inflowing because it may because of this money is coming to India because Indian interest rate and US interest rate is positive. So, there will be more supply of more movement of inflow of dollar to domestic economy. When more inflow of dollar domestic economy is coming, the dollar will be converted into rupee and rupee circulation in the economy is increasing. The rupee circulation of economy increases; it may create what is called inflation in Indian economy.

The inflation here we are considering nominal money nominal interest rate, but when inflation in the economy is increases, inflation differential inflation in India minus inflation in US, that difference that difference because of supply of more domestic money, will be further. When inflation is more in India, the real interest rate may come down; real interest rate differential may reduce. When this real interest rate differential reduces, it leads to what is called less supply of FII or FDI investment in the economy.

So, to some extent, the money supply through the interest rate influence, through the interest rate through the inflation differential, also influence the exchange rate side. So, we have to understand the exchange rate, exchange rate through the money supply domestic money supply in the economy. Suppose this, another concept we can understand here. Suppose M3 that domestic money supply the Government or the

emerging economy in case of India, Government want that there should be more supply of money in the economy. How the Government will supply? Government will reduce the domestic interest rate. Government will reduce the domestic interest rate; in the sense, that RBI in case of India reduce the policy rate. The CRR, SLR or your bank rate, repo rate, they may reduce that this rate.

Once the policy rate reduces, bank will also reduce the domestic interest rate. When domestic interest rate comes down, credit uptake will be there. Credit uptake will be credit up take will be more in the economy. When credit uptake is more in the economy, there will be more circulation of money in the economy. When circulation of money in economy increases, it may create, to some extent, short run inflation in the economy. Domestic inflation may increase; domestic inflation, domestic inflation increase leads to reduction of real interest rate. Nominal interest rate will come down because of more circulation. Government want policy rate come down. At the same time, when more circulation of money are there, inflation increases; so real interest come down; significant reduce in the economy. Then, once the real interest rate reduce, the supply of dollar to domestic economy may suffer and this way the money supply that is M3, through the interest rate, through the inflation, also creates some kind of determinant structure for the exchange rate in economy. So, that also we have discussed in monetary approach.

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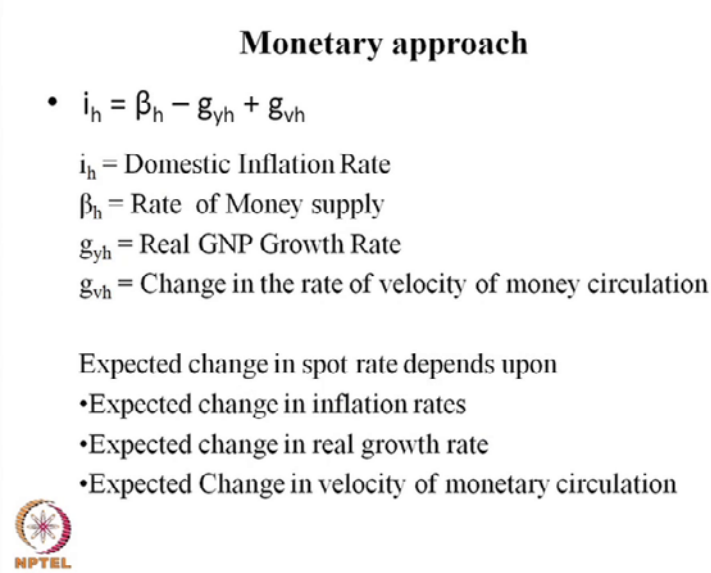

In another approach, same thing also here provide how domestic inflation rate is equal to rate of money supply; rate of money supply minus g g y h; g y h is real g n p growth; domestic g n p growth rate and g v h the rate of velocity of circulation of money. How money, how the circulation of money in economy increasing, the rate of circulation of money? That will give us the domestic inflation rate.

So, domestic inflation rate is influenced by domestic inflation rate is influenced by rate of growth of money supply, the rate of growth of real sector and also rate of growth that is change in the rate of velocity of circulation of money; that determining what is called inflation rate in the economy. When growth is domestic inflation is supply of money is more and velocity of circulation of money is more, then there will be more inflation in the economy. When inflation is more, then real money supply, real interest rate in the economy will decline and this also influences what is called influence the exchange rate in a economy.

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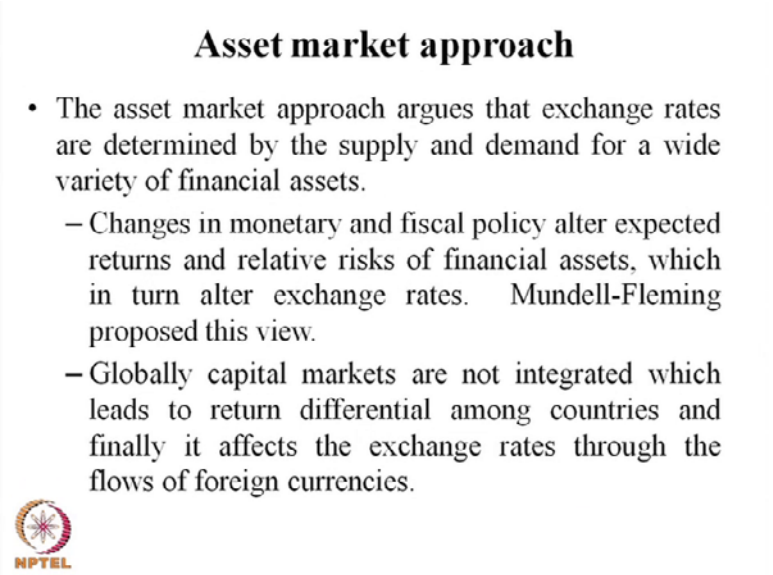

Asset market approach: I have mentioned earlier, the asset market approach primarily consider the foreign exchange asset. And each supply and demand, its supply and demand through also influences the exchange rate movement. Here, you have to understand the two things: the Monetary policy and Fiscal policy. The Monetary policy is change in the Monetary and Fiscal policy alter the expected return and relative risk of financial asset, which in turn alter the exchange rate.

To understand that, here one theorem is called Mundell-Fleming theorem; we are not discussing in detail; you can you can read any economics book on Monetary or Macroeconomic school book on in the area of Mundell-Fleming approach. The Mundell-Fleming approach, there is intricacy between intricacy or complexity or complex relationships are there between money supply. There is monetary side and taxation side or Government borrowing program that is fiscal side. The monetary and fiscal policies together create some kind of environment when where the exchange rate also affects because of the monetary side and fiscal side.

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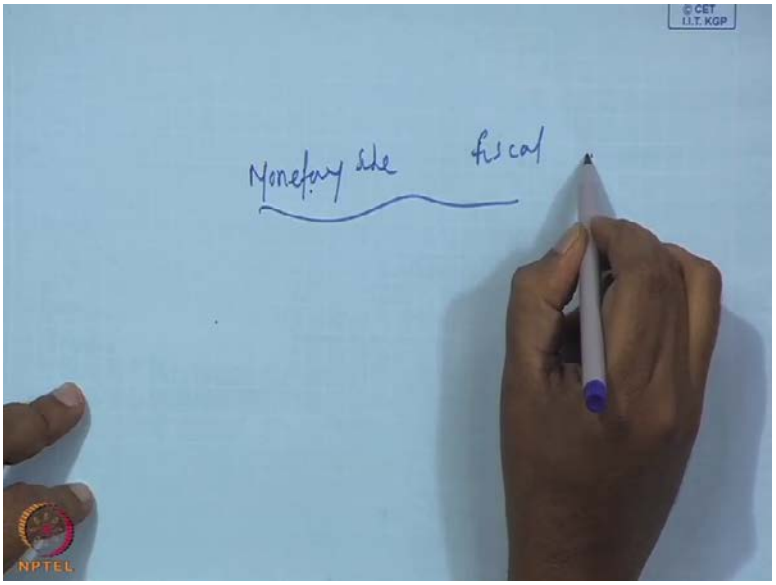

Monetary side, here particularly the money supply; money monetary side monetary side and fiscal side, these two together determining the Mundell-Fleming theorem and the money supply and Fiscal; Fiscal is Government borrowing program, Government taxation program, Government taxation market borrowing program also influence the structure of interest rate in the economy.

When the structure of interest rate in the economy influences, the interest rate again or influence the, what is called, the differential interest rate between two countries and that determine the exchange rate. In the monetary side, the supply of money or demand for money along with the inflation and interest rate influence the exchange rate. So, monetary side and fiscal side together as a asset market variable, they determine the

exchange interest rate, inflation and along with that they influence the exchange rate in the economy; that actually I have discussed in the asset market approach.

Asset market approach also some extent is influenced by the economic integration. If the domestic economy is integrated with the world economy, the world inflation rate or international inflation rate, international interest rate, international inflow outflow of foreign currency, some extent also influence the domestic policy parameter which in turn also influence the exchange rate determination process.

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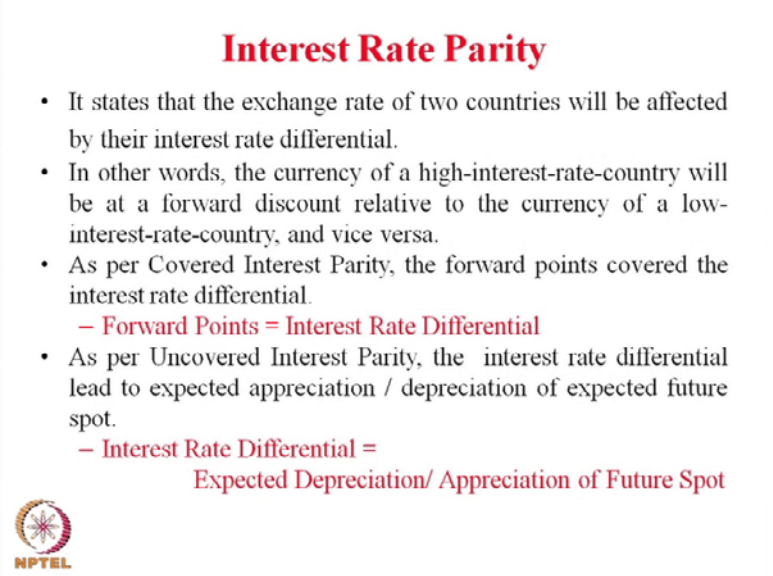

So, we discussed in detail about the interest rate parity, the forward point, forward rate differential expected depreciation. If there is a interest rate differential is positive, it lead to forward depreciation of currency; inter differential is negative, it lead to appreciation of domestic currency.

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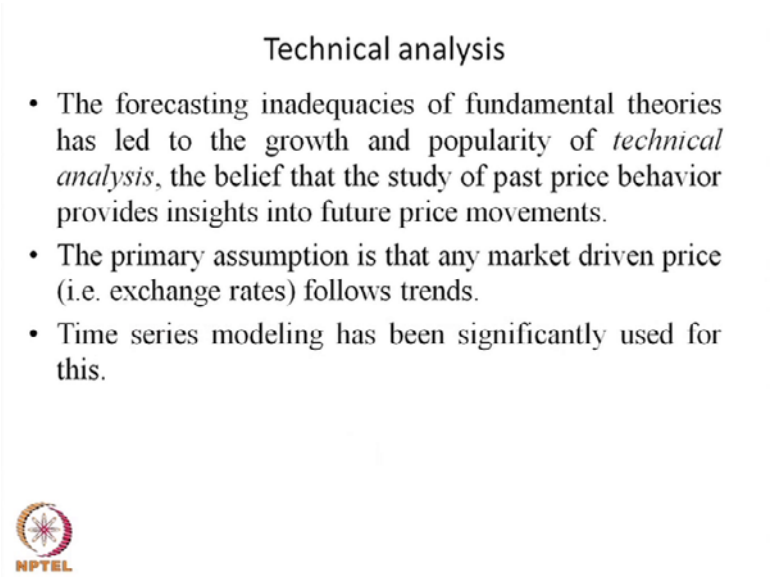

That has a part, we have discussed interest rate parity hypothesis. To some extent there are also other parameters, other than macroeconomic parameter; other than interest rate parity parameter; it is called technical side, technical analysis.

So, it is a behavioural parameter. The traders are the main influencers. Traders are the main influencers of very short term interest rate. Trader, they take position in the foreign exchange market, their behaviour, and their approach to market also influence the exchange rate; very short run. The traders here technical side; there candlestick models are available; technical analysis are available. Through the technical analysis side candlestick model, they take position in the foreign exchange market and their behaviour expectation or the behaviour also influence the very short term interest rate in the economy.

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Then, here also, in the asset market approach, there are another other aspect is also there; that is called relative interest rate hypothesis capital market; capital market liquidity, a country's economic and social infrastructure, a political safety, the corporate governance practices, the contagion that is spread of crisis to different region speculation also these parameters some extent influence the exchange rate in economy.

So, exchange rate forecasting is a very complex phenomenon. You have to take into account macroeconomic parameter; you take into account the physical side, the monetary side, interest rate side, you take into account the corporate behaviour, traders behaviour, you have also take into account the international integration of domestic market. Also some extent the behavioural parameters of the traders in complex way you have to determine the exchange rate.

There is no there is no single theory which can help in determining the exchange rate; many theories are there; all theories are complimentary to each other and together they can describe, to some extent, the actual moment of exchange rate. However, what will be the actual exchange rate? It is very difficult to predict exchange rate itself. It changes very frequently. While the exchange rate market is high, highly traded and highly liquid market and these volumes trillions of dollars, trillions of dollars of transactions are there, and a single moment and there will be these market is highly liquid and the expectation,

the interest rate, exchange rate, interest rate, inflation macroeconomic parameter, the fiscal monetary side and behaviour of the traders together determine the exchange rate.

If you want to predict the exchange rate, you have to you have to factor all these in our in our model. And now a days people are predicting the exchange rate through different kind of models. The models are may be deterministic models, some models are something a time series model and these models are available in different text books. You can go through the models and understand how these parameter, what we have discussed in they, are helpful in determining the exchange rate in a economy.

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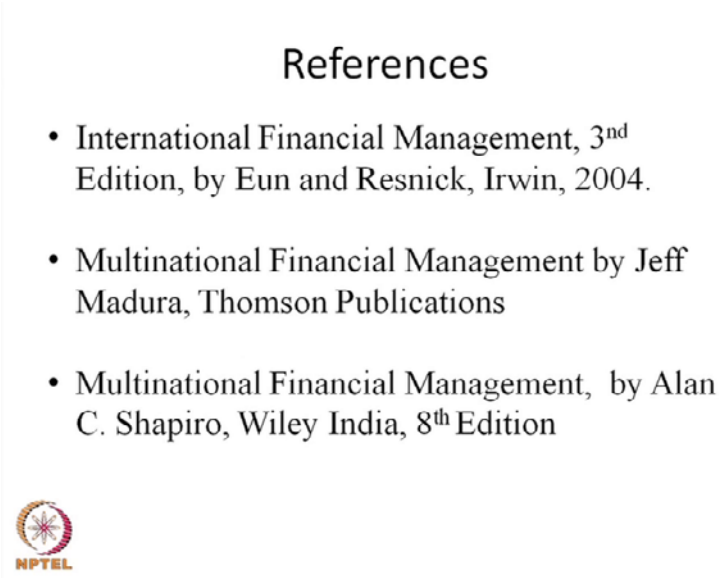

Now, references are there. Same references, whatever we have discussed earlier session in a Resnick book and the Shapiro book. There are foreign exchange forecasting sites, some extent discuss in detail. With also Madura book Jeff and Madura that is multinational financial management discuss how the forward interest rate parity hypothesis help in forecasting the exchange rate; particularly near future exchange rate. Also, you can also read some books on Monetary Economics, some books on macroeconomic, how the macroeconomic parameter influence the exchange rate.

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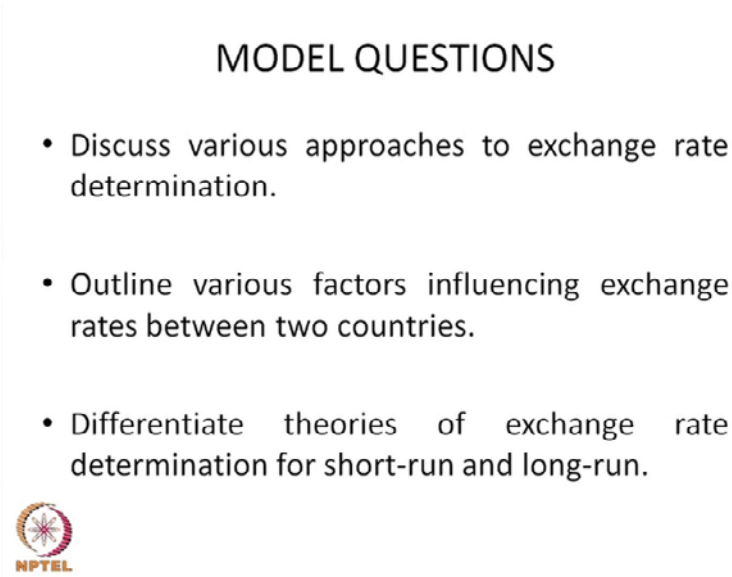

Some model questions here. The model questions, I have framed some questions in a long. You have to discuss it; briefly discuss various approaches to exchange rate determination. Here, you have to discuss all approaches. The parity hypothesis, you have to discuss the monetary approach; you have to discuss the asset market approach; you have to discuss what is called your the balance of payment side, and then articulate how the exchange rate can be can be influenced through this interest rate parity, export import side, balance of payment side and monetary approach side.

Outline various factor influencing exchange rate between two countries: When you consider two countries, here you have to take into account, articulate their value; first you identify the factor. The factors are you can segregate the factor into macroeconomic factor that is interest rate, exchange rate, interest rate inflation, growth rate. Then some extent fiscal parameter, some taxation, some there borrowing government borrowing programme, government controls on market. These are the factors which generally influence that two country exchange rate.

And primarily the factors are here growth demand and supply of foreign currency, and also the interest rate differential, inflation differential and the forward movements of currency. Because it may happen that the trader might have taken significant position in the particular currency. So, that also influences the domestic interest rate between two countries.

Differentiate theories of exchange rate determination for short run and long run: Short run and long run, as we have discussed in long run, long run with a purchasing power parity, that is a fundamentals in long run determination of exchange rate; in short run, it is the money supply; it is the demand and supply of foreign currency; it is the inflation differential, interest rate differential - these are the few determinants determinant for the short run movement of exchange rate. Long or it is only the purchasing power parity which decides the long run movement of exchange rate. Also you can consider long run, particularly the financial sector liberalisation program of a particular country and the country outlook for the coming outlook for outlook or sovereign risk, sovereign rating side also influence the long run movement of foreign exchange rate.

Thank you.