International Economics

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Lecture No. # 06

Good afternoon. We will carry on with, the things that we left yesterday; that is the proof of the Marshal Lerner condition which says that a devaluation or depreciation will improve the current account balance, if the sum of foreign and home import demands elasticity's is greater than one.

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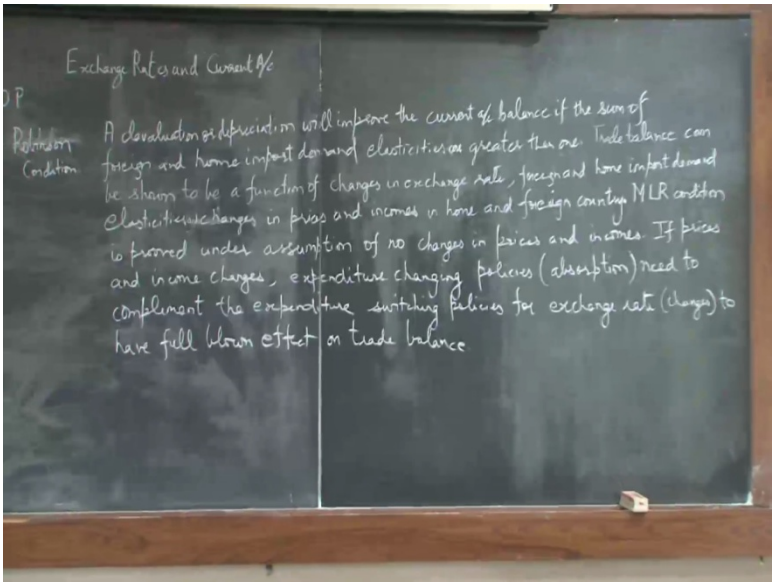

Now, this condition is proved under stringent assumptions that is, home and foreign prices, and home and foreign incomes are constant. And in when I say stringent assumptions, one already knows that if there is a switch in expenditure it tends to have an impact on the aggregate demand. And if the aggregate demand changes, it has an impact on prices and incomes.

So, it may negate the impact of the change in the nominal exchange rate on trade balance. So, the expenditure changing policies or absorption approach is considered to be the most likely partner of the expenditure switching policies, because you need the expenditure changing policies to compliment the expenditure switching policies. For exchange rate for exchange rate changes to have full blown effect on trade balance. So,

first I will quickly go and derive the the Marshal Lerner condition, and then we will see that how trade balance is a function of the real exchange rates. Once we do that then we will see how expenditure changing policies can be complimented with the expenditures switching policies, for exchange rate changes to have a full blown effect on trade balance.

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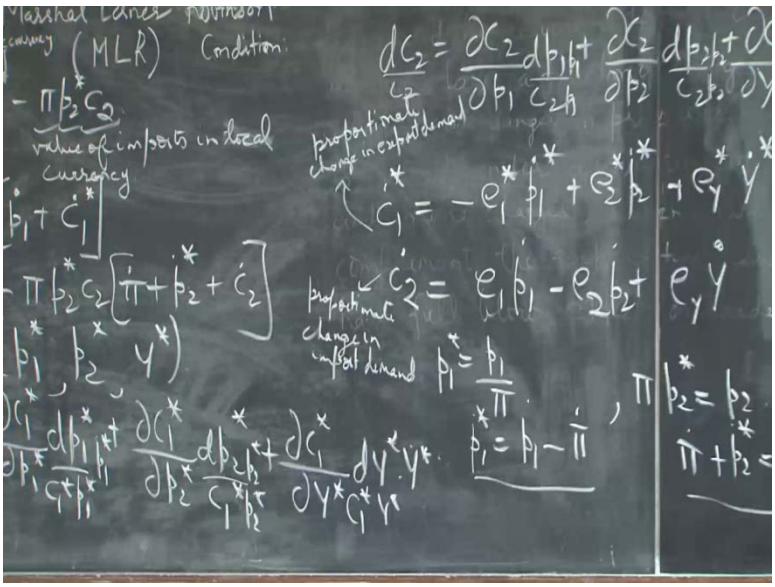

So, the first thing that you do is, to define the trade balance this is in terms of the local currency. So, you have P 1 C 1 star minus pi P 2 star C 2 this is the exports, value of exports in domestic currency, this is the value of imports in local currency in local currency or domestic currency. So, then the change in trade balance is P 1 C 1 star P 1 proportionate change in the price of exports plus the proportionate change in the export demand minus pi P 2 star C 2 pi dot plus P 2 dot star plus C 2 dot where the dot denotes proportionate changes.

Now the export demands, this is the export demand this is a function of P 1 star P 2 star and incomes prevailing in the foreign country. So, then using the total differential rule d C 1 star is del C 1 star del P 1 star d P 1 star plus. Similarly, home import demand is a function of P 1 P 2, and income its own price that is P 2 P 1 the price of the other good which is the export good and the domestic incomes and so the change, yes this is the using the total differential rule. So, in this in the first you divide by C 1 star C 1 star, and

multiply and divide by P 1 star divide by C 1 star P 2 star P 2 star C 1 star Y star into Y star.

So, what you would get from here is, C 1 dot star the proportionate change in the export demand, this is the proportionate change is the foreign export demand elasticity minus e 1 star P 1 dot star plus e 2 star P 2 dot star plus e y star Y dot star where e 1 star, is the home is the foreign sorry the foreign export demand elasticity, e 2 star is the foreign cross price elasticity, you do not know the sign, because it is it depends on whether the good is substitute or the compliments and then you have the income elasticity which is greater than 0, because you are considering your export good to be a normal good normal good. So, you get this from the second C 2 dot, you get e 1 P 1 dot minus e 2 P 2 dot plus e Y dot. e 1 is the cross price elasticity, e 2 is the the home import demand elasticity and e Y is the home income demand elasticity.

So, how did I get this again I divide by C 2 divide by C 2 divide by C 2 multiply and divide by P 1, and then define e 2 to be, this is the (No audio from 09:50 to 10:32) then you also define, P 1 star which is P 1 by pi. So, P 1 dot star is P 1 dot minus pi dot and pi P 2 star is P2 so, pi dot plus P 2 dot star is equal to P 2 dot. You have this this and you have the proportionate changes in the export demand, the proportionate change in import demand.

Now, the only thing that you need to do is, now you have to put it in this equation which has the change in the trade balance and we going to put it there, and then see what we get.

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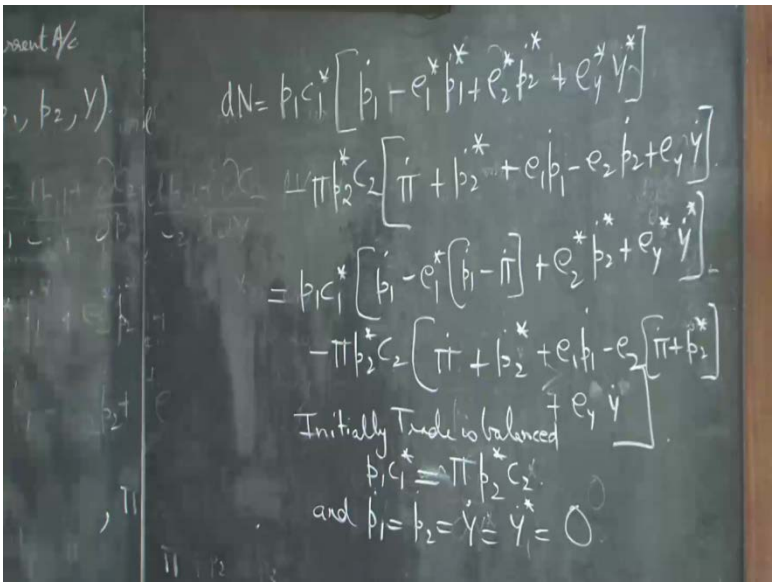

So, look at look at this term here, in the terms inside the first parentheses instead of P 1 dot star I have replaced it with P 1 dot minus pi dot and in the second parentheses, I have replaced this term P 2 dot with pi dot plus P 2 dot star. And then noting that the initial trade is balanced that is exports are equal to the imports, and there are the prices are fixed there is no changes in the prices and incomes, we will see what we get from here.

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Yeah e y dot yeah, so.

(( )) function c (( )) in the, but star will be equal P 1 dot (( )) star (( ))

Because the home and the foreign prices are fixed. So, there are no changes.

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They will be fixing no.

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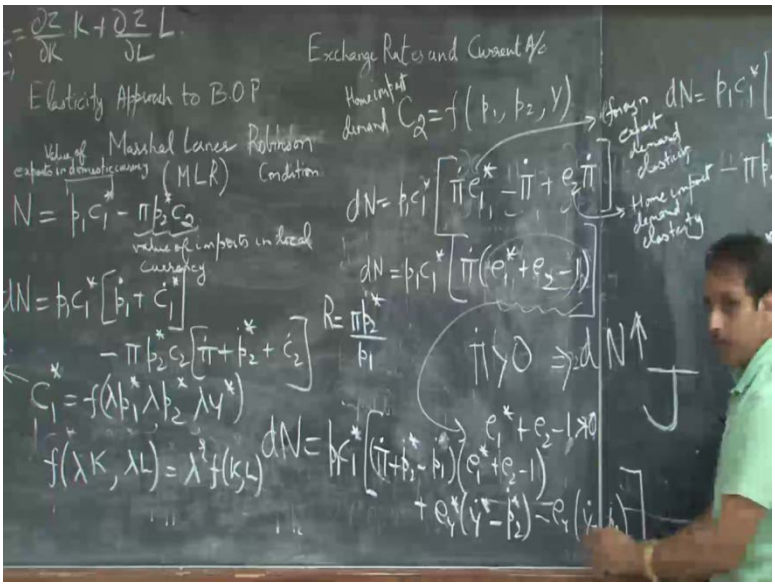

Yeah. So, d N see here noting that the trade is balanced and P 1 dot is equal to P 2 dot is equal to 0, there no changes in the incomes, what you are left with will be these terms, pi dot e one star minus pi dot plus e 2 pi dot. Now, this was the foreign export demand elasticity, this was the home import demand elasticity, this was the foreign export demand elasticity, this was the home import demand elasticity. So, so then you get the change in trade balance as a function of the proportionate change in the exchange rate and this term and the Marshal Lerner condition says that if the sum of the foreign export demand elasticity and home demand elasticity is greater than 1.

Then you a get a positive term here and if there is a depreciation; that means, pi dot is greater than 0 then only you will see an improvement in the current account balance. So, that is what Marshal Lerner condition says, that if the sum of the home and the foreign export demand elasticity is greater than 1, then only depreciation that is when pi dot is greater than 0 it would lead to an improvement in the current account balance, provided you have e 1 star plus e 2 minus 1 to be greater than 0 or e 1 star plus e 2 to be greater than 1.

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Foreign export demand elasticity

Export (( ))

Export demand you are exporting their demand for your exports.

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Foreign export demand; that means, whatever you are providing your exports, you are supplying something it is the demand for that particular exports. You have mentioned as eve is the foreign import (( ))

Did I mention foreign import?

Foreign import.

No home import demand elasticity if there is then you makes a correction export demand elasticity, home import demand elasticity foreign export demand elasticity. This this curve that you have is the export demand curve the export demand curve. So, when I said probably what I would have meant that if you are in foreign, then it is their home their demand elasticity, whatever is your export is their imports. So, maybe it is import demand elasticity from their point of view, whatever is your export is their demand and so, whatever is your export are their imports. So, you can always say that foreign, if you are if you are existing in you is living in a foreign country. So, their import demand elasticity and then we become foreign, but whatever it is it is demand elasticity import and foreign and home export and import demand elasticity.

(( )) mention that the sum of (( ))

Yeah. So, see what I am saying is that if you are considering this to be a foreign, if you are in foreign country then it become whatever is your export is your imports. So, export demand for us and import demand for them. So, in many of the books this definition also works, provided you understand what they are saying. So, whatever is your imports is their exports right and whatever your export is their imports. So, this foreign export demand elasticity is import demand elasticity for the foreigners, because whatever is your exports is there imports. Home import demand elasticity is whatever is your import is their exports. So, they if they write they would say export demand elasticity existing in India. So, then the important thing is that these are demand elasticity's export demand elasticity from our point of view from their point of view it is import demand elasticity.

This is from our point of view import demand elasticity, for them it is export demand elasticity, because whatever are our imports is their exports. So, this tells you that the change in trade balance is a function of this only, pi dot plus e 1 into e 1 star plus e 2 minus 1 if e 1 star plus e 2 minus 1 is less than 1, then appreciation of the exchange rate will improve the current account balance. So, from your point of view, it is it will be interesting to look at some econometric studies and which have worked out these elasticity's it is not that simple, but you should look at the professor SternsWork. Professor Sterns Work, who has worked out these elasticity's using different econometric equations.

Further, we will show that the change in the trade balance is a function of the real exchange rate and the changes in incomes and prices. So, what we will prove now is that d N will be P 1 C 1 star; we will get pi dot plus P 2 dot star minus P 1 dot star e 1 star plus e 2 minus 1. So, what we will derive now is, that the change in the trade balance is a function of this m l r condition, e 1 star plus e 2 minus 1 and here you have you would have pi dot plus P 2 dot star minus P 1 minus P 1 dot. So, this is the changes in the real exchange rate, where the real exchange rate is pi P 2 dot P 2 star P 1. The real exchange rate is the reciprocal of the terms of trade pi P 2 star by p 1. So, r dot if the proportionate change in the real exchange rate, would be pi dot plus P 2 dot star minus P 1 dot and then it is a function of the real incomes existing in home and foreign country.

So, see what happens in actual practice when you depreciate your currency it tends to have an impact on either incomes or prices, because whenever there is a switch in a expenditure say from foreign to home goods, the aggregate demand in the economy goes up. When aggregate demand in the economy goes up it tends to have an impact on the prices and incomes. So, it is possible that pi dot is greater than 0, but then it is also possible that P 1 dot also goes up your domestic prices also go up, as a result there is no change in in this figure the real exchange rate remains the same, marshal Lerner condition is satisfied, but there is no change in the real exchange rate. As a result you see no changes in the current account balance. So, if you look at the history of the devaluations which are undertaken by country specially the once in Latin-American they devalued their currency heavily, but they found that the inflation was also creeping in, as a result there was no change in the real exchange rate and there was no change in the trade balance.

When India liberalized an India did a heavy depreciation in the mid-sixties of the level of 36 percent, if you see the the impact on the prices it was moderate. So, there was a some impact on the change in the trade balance, but what Latin-Americans did in the eighties was? That they did not supplement or compliment the expenditure switching polices with the expenditure changing polices, because as soon as you depreciate your currency the domestic price of the imported good goes up. And then it brings in inflation in the economy and you already know that when prices changes, the change which should come about in the export demand or the import demand is little sticky, it is not that if you change the prices today immediately you will see a change in demand, it takes time. So, what happens is that, initially when you do devaluation there is a possibility of something like J curve phenomena J curve phenomena

Now, look at this J curve, the current account balance instead of improving initially first goes down and then after sometime it improves this happens, because the demand does not respond immediately to the changes in prices. So, you you see a J type of phenomena, and then this current account balance is not only a function of the real exchange rate, the real incomes in foreign and home country, but set of other factors also current account balance is a function of many other variables.

So, even if you are changing the nominal exchange rate, incomes may be changing that also has on impact on the on the current account balance. So, many countries have observed this J curve phenomena, many countries has seen inflation creeping in, because of devaluation many countries have seen a changes in incomes, and so this change in trade balance is also, is always a lagged impact is always a lagged impact of the changes in the nominal exchange rate. So, it will be interesting for you to find out in case of India, that whether this changes and exchange rate has immediately having an impact on the trade balance or is there a lagged impact, what can be the other factors which have an impact on the trade balance. So, you can go into that type of question.

But given this equation at least you have an equation to estimate, you have an econometric equation to estimate where in you you can have all these, you have to convert it into an econometric into an econometric equation, where in it is possible that you you have data on these, put this as your parameter. If you are not able to calculate the the elasticity's, you have data on the real incomes considered this has to be your parameter and then may be used non-linear least squares to estimate the equation, where

in you get some idea of this, this and this. So, by estimating this you can get some estimates of the elasticity's e Y star e Y e 1 star plus e 2 minus 1, but there are studies which straight away estimates this elasticity's in an econometric specification.

Once you have the equation with you, once you have the regression equation, you can put these values and forecast the value of the trade balance, that you can do or if you want to start with a very simple exercise, you have these exchange rates in the economic survey, you will find a figure for nominal effective exchange rate, you will have a figure for real effective exchange rate which are like a weighted average of the bilateral exchange rates. Plot this against the current account balance for India, just plot these two figures and with a in the excel make a red line and a blue line and see whether they go together or they are they they are converging or diverging. So, one does a exercise for the United States, see what you get you get this a hand out which I distributed yesterday look at, the figure 18.4 look at the figure eighteen point four this is plotting real effective exchange rate, it is not a bilateral exchange rate, it is a weighted average of the bilateral exchange rates of US. So, real effective exchange rate on the y axis and then trade balance on other other side that is y axis and on in the X axis you have years from 1975 to 2005.

So, at least till 2000 you find that when the real effective exchange rate increases, the trade balance goes up. When the real effective exchange rate decreases the trade balance goes down there is some sort of lagged effect, but then it gives an indication that probably this is true, that when you depreciate your currency it tends to improve the current balance. Except for year from 2000 to 2006, where your trade balance and your real effective exchange rate they are diverging, the depreciation is not able to improve the trade balance. So, would not it be interesting to to do it for India and work out, whether this has been happing, and if you find evidence that it if it is not happing then you may think, that the trade balance is not a only a function of the exchange rates, but it is also a function of the prices, and and the real incomes.

So, this you can do economic survey already gives the real effective exchange rate, REER and NEER data from right from 50s till date, and you have the current account balance, you just have to see whether there is a long term relationship between the two variables. If you have to find the long term relationship there is something like a co-integration which you can do or you can just find out the correlations over time, and see

and plot them and see, whether the two are correlated with each other in this process you will come to know about this, this REER real effective exchange rate, which is not a bilateral exchange rate, it is like weighted average of the bilateral exchange rates which exists between India and its trading partners. And they report a 6 country and a 36 country weighted average index.

So, look at that and then see whether you can you can see any relationship between effective exchange rates, and and trade balance. If you wish to test the J curve phenomena, that means if exchange rates are improving you current account balance is going down and then it is going up. So, it is like an inverted U. So, you know which type if you have to estimate this you know which type of economic trick equation to fit. It will not be Y is equal to a plus b X it will be y is equal to a plus b X plus c X square c b positive b b negative, because it is U shaped.

So, you have two variables which are exchange rate and you have the current account balance. So, exchange rate is changing the current account balance is going down and then it is going up right. So, then you can you can have a parabolic type of relationship between exchange rates and the current account balance just to test the the J curve phenomena, and then you can have a bigger specification right, current account balance has a function of not only exchange rates and exchange rates squares, but incomes prices and then you estimate the the model. So, that you can do.

(( )) J curve phenomena this is taken (( )) one.

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On the current account balance them first and because there is lagged lagged effect the current account first deteriorates, and then after sometime it goes up. So, maybe you have a lagged variable on the right hand side, something like a lagged variable right. So, think of much specification. So, when you go into it, you will read literature on this J curve phenomena. So, and then as I said working out the elasticity's is something that you could do how to get the elasticity's, and there's a whole lot of literature follow the professor sterns work then followed by Michelle's work way back in the 50s probably.

So, then let us the last thing that we need to prove is this I do not know whether we have much time, can you can you try it back home.

Yes sir.

Right. So, what you need to do is something, what you need to do is define this demand function and you already know the demand function is homogeneous of degree 0, if it is homogeneous of degree 0 you already know a homogeneous function. This is a homogeneous function of degree r. So, if r is 1 it is it is homogeneous of degree 1, if r is greater than 1 it is homogeneous of degree 2, if r is less than 1 homogeneous of degree less than 1, if r is 0 if r is zero, then it is homogeneous of degree 0 and you already know that the demand functions are homogeneous of degree 0. So, what you would get would be C 1 star lambda P 1 lambda P 2 lambda y star, because lambda raise to par 0 would be 1. So, you get C 1 star to be this.

Now, if this is so, then use the Euler's the Euler's equation. Remember the Euler's equation which was r z, if z was a homogeneous function r z del z del (( )) del k plus del z del l this was the Euler's equation. It is not that total differential rule; it is r is the degree of homogeneity. So, you will get zero equal to del C 1 star del P 1 star into P 1 star plus del C 1 star del P 2 star P 2 star plus del C 1 star del Y star Y star. So, then you convert it into elasticity's. So, you do it for foreign and home and then put it back put it back in this big equation, replacing the value of e 2 star and replacing the value of e 1, and then collecting the common terms you will get this.

So, then trade balance is a function of the real exchange, rate and the real incomes. So, even if there is a change in the nominal exchange rate prices, and incomes may change to negate the impact of the nominal exchange rate, as a result there is there will be no change in the current account balance. But it is an empirical thing you need to look at each countries data, and see whether this holds or not. So, it is up to you to take it out. So, I will end up here, next time we will see how absorption approach, and elasticity approach or complimentary each of other. Thank you.