International Economics

Prof. S. K. Mathur

Department of Humanities and Social Science

Indian Institute of Technology, Kanpur

Lecture No. # 41

Good afternoon, today we will continue with our discussion on the effects of immigrations in the long run. We had seen earlier, while discussing the effects of immigration in the short run that immigration tends to have an impact on the output makes of manufacturing and the agricultural sector.

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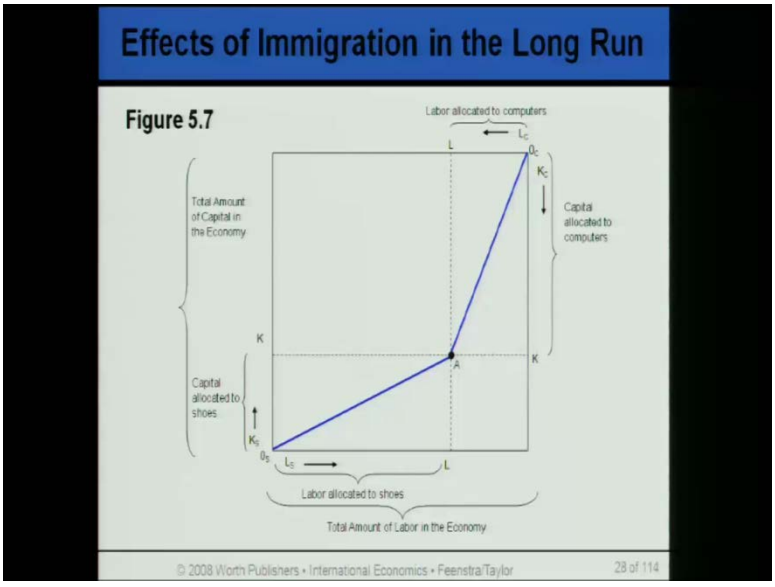

The output of both agriculture and manufacturing sector increases reason being that the labor gets absorbed in both the sectors that is manufacturing, which is capital specific and agricultural sector, which is land specific and because, the labor increases in both the sectors marginal productivity of labor goes down. So, the wages go down in the short run but then the marginal productivity of capital and marginal productivity of land increases in the short run. So, we will further see the empirical evidence of the effects of immigration in the short run.

Now, coming to the effects of immigration in the long run, you will see that we will resort to the Rybczynski theorem. The Rybczynski theorem can best explain what is the

possible impact of immigration in the long run, please recall that the Rybczynski theorem is that an increase in supply of a factor keeping more this is very important product price is constant and when you assume product prices to be constant, you further assume that the relative wage rates are same, you assume capital labor ratio eventually is the same and so the Rybczynski theorem is that an increase in supply of a factor keeping product price as constant increases, the output of the commodity which uses the expanding factor intensively and decreases the output of the other commodity.

So, what we are saying is that in the long run, there will be a change in the output mix, there will be an increase in production of the labor intensive product and a decline in production of the capital intensive product. Assuming that the product price is the relative wage rates and the capital labor ratio does not change, so marginal productivities do not change. So, by assumption Rybczynski theorem relates the supply of factor to the to the output of the commodity. Now, you can see in this diagram there are two industries, one is the shoes and the other is the computer industry. The shoe industry is labor intensive, while the computer industry is capital intensive and you can see with the slope of this particular line 0 S A is smaller than the slope of the other line which is OCA.

So, the labor the total amount of labor in the economy is from this origin to this end and the labor allocated to shoes is this much, the rest is the labor allocated to computers. The capital allocated to shoes is from 0 S K and the capital allocated to computers is OCK. So, you can see from the diagram that the shoe industry employs more of labor, while the computer industry employs more of capital.

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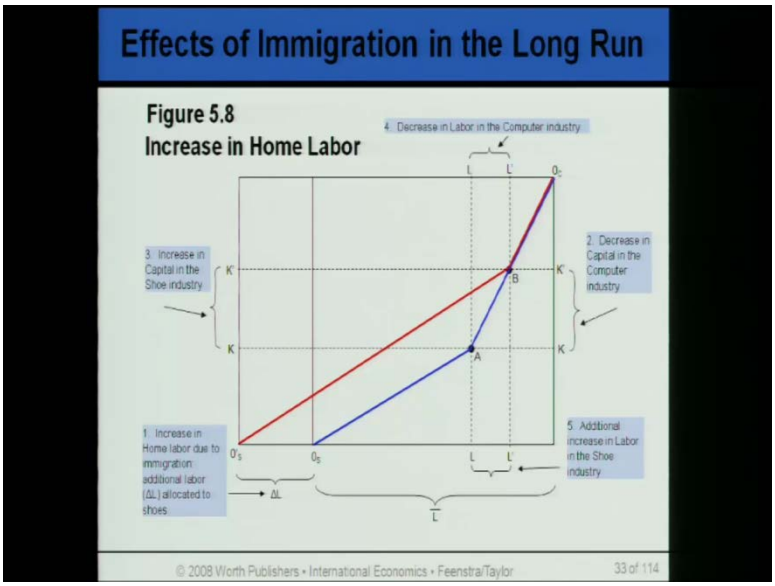

Now see what happens, if you are talking of a long run impact of immigration in the economy. So, I am skipping the explanation and I will straight away go to the figure to increase to show you what happens in the when there is an effect of immigration in the long run. Now, you can see that the increase in home labor due to immigration is allocated entirely to the shoe production. So, you see a leftward shift of the origin from 0 S to 0 S dash. So, the difference between the short run and the long run impact is.

So, you can see in this diagram, which is from Feenstra and Taylor that what happens with an increase in home labor that is immigration takes place. Now, the difference between the short run and the long run is that the entire it is assumed that the entire home labor gets absorbed in the labor intensive industry, which is the shoe industry. Now, you can see in this diagram the 0 s point shifts to the left and its now 0 dash s. So, the origin changes from 0 s to 0 dash s implying that the entire home labor gets absorbed in the shoe industry.

Now, when the entire labor gets absorbed and we are assuming that the eventually, the capital labor ratio has to be the same. So, for this some capital needs to move from the computer industry to the shoe industry. So, you will see a decrease in capital in the computer industry. Now, if you see to the right of this diagram K K dash is the decrease in capital in the computer industry. Now, so the capital moves because it is a long run so, the capital moves from the computer industry to the labor industry. Eventually, there is

reorganization taking place, some additional increase in labor also happens in the shoe industry. So, you see that there is a movement of capital and labor from the computer industry to the shoe industry and at the end, capital labor ratio remains the same in each of the industry. But then reallocation is already taken place, the computer industry loses capital and labor. The shoe industry increases the amount of accumulation of capital and labor. But at the end capital labor ratio remains the same.

So then, because of this, there is an increase in output of the labor intensive industry and a decline in output of the capital intensive industry, which is the computer industry. Now, this red line 0 from 0 s dash to b signifies that the capital labor ratio in both the industries eventually remains the same. Even though you have more of capital and more of labor in the shoe industry and you have less of capital and less of labor in the computer industry. Eventually, capital labor ratio in both the industries remains the same. So, what is happened? The output of the shoe industry has gone up, the output of the computer industry the capital intensive industry has gone down. So, that is the effect of immigration in the long run it has an impact on the output mix, rather than on the relative wage rates, rather than the impact on the marginal productivities, rather than the impact on the capital labor ratio. The impact is on the output.

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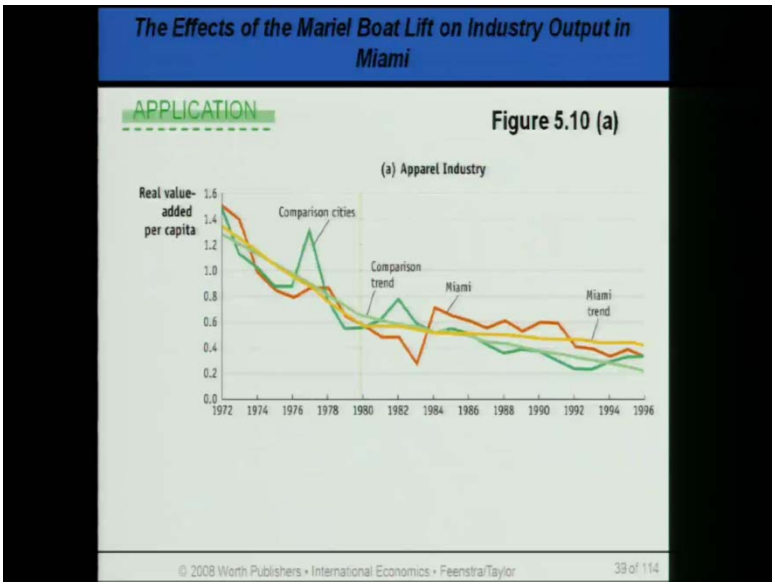

Now, what we need to see is whether empirically something of similar sort has happened. So, I am skipping what I have already explain and I am giving you the effects

of the Mariel boatlift on industry output in Miami, I am talking of again that same time period in 1980 when around 125000 Cubans, because of various i am not going into the political aspects of this. But they moved from Cubato a place in Florida, which is Miami. Now, if you wish to see the impact of this immigration taking place on the U S economy, you will see apparel industry, which is a labor intensive industry in Miami. You will see that there is a deceleration taking place but the city of Miami does better than the other cities. Signifying that there is some sort of a Rybczynski effect taking place as labor moved from Cuba to US, the output of the labor intensive industry went up.

Now, you see a deceleration because that was a time, when you had deceleration in the economy. In the U S economy you see a downward trend but, then if you see this yellow the yellow line it does better than the other cities, which are colored in red, in light green and dark green; signifying that there is some sense of the Rybczynski impact coming in.

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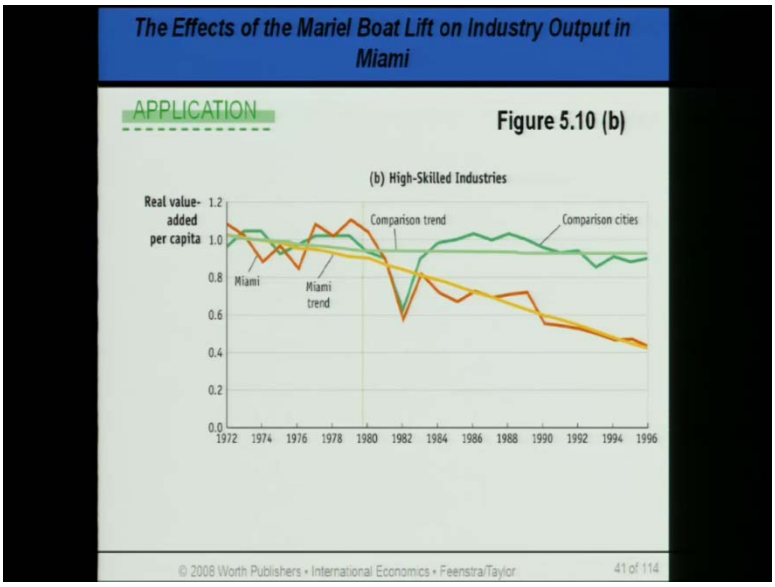

If you see the impact on the capital intensive industry high skilled industries, you can see that the Miami trend shows a downward trend it does worst than the other cities. Signify that as labor moves from Cuba to US, the output of the labor intensive industries go up. But the output of the capital intensive industry goes down. So, you can see the Miami trend although it all of them have shown a downward trend, the city of Miami does badly more badly than the other cities in terms of the high skilled industries. So, you do see an

impact of the Rybczynski impact of the migration of the Cuban labor to the U S economy.

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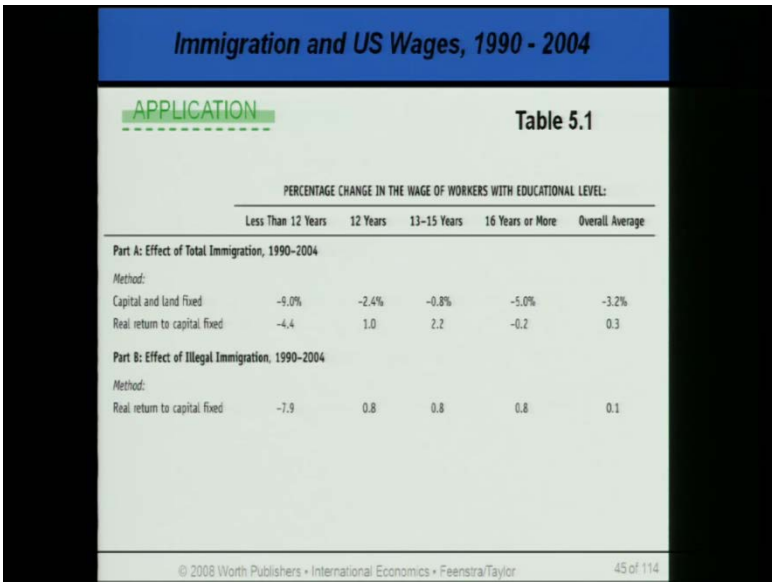

Now, I want to show you a one the application again in terms of figures, this is the percentage change in the wages of workers education level less than 12 years,12 years,13 to 15 years, then 16 years or more and overall average. Now, part A shows the effect of the total immigration from 1990 to 2004. Now, there are 2assumptions one when capital and land is fixed. So, we are talking of the short run phenomena, where we can use the specific factor model to explain what happens to the wages.

So, you will see that the percentage change in the wage of workers with education level less than 12 years, when capital and land was fixed is minus nine percent. Please recall what happens when the migration takes place in the short run, the labor gets absorbed in both the industries. So, the marginal productivity of labor goes down, so you see with less than twelve years the percentage change in wage of workers is minus nine percent and for 16 years or more its minus 5 percent for 12 years and 13 to 15 years the impact is lesser than the impact that you have on the wages for workers with education level less than 12 years and 16 years or more. Please recall our discussion yesterday that in U S most of the foreign bond immigrants are belong to a group of workers with education levels either with less than 12 years or there are substantial foreign bond immigrants who have who belong to workers with education level 16 years or more.

So, here you can see the short run impact, that the wages in the lower and the higher end get effect. The overall average is also negative at minus three point two percent. But then if you see the long run, where the marginal productivity is does not change or the real returns to capital is fixed, you will see that there is a decline of the wages in less than 12 years. But for all other years it is positive. So, the overall average is 0.3. It is positive, so when the immigration takes place and you are analyzing a long time period, you see that the effect of immigration on the percentage change in workers is positive rather than negative.

So, this is a result which proves the Rybczynski impact and generally it negates the myths some times which says that immigration leads to a decline in wages essentially. So, in at least in the US case, you see that in the long run the wages of all the workers go up. Now, this is my last point on the immigration and US wages.

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Now, I come to the movement of capital between countries, which is foreign direct investment is again a very sensitive issue, when it comes to FDI in coming in the developing countries. But, our analysis will be the same of what we did, when we were trying to understand the impact of immigration labor immigration on the economy. Now, the difference is that you have capital coming in from the developed nations to the developing nations. So, again in the short run we will resort to the Ricardo-Viner theorem which is also called the specific factor model.

In the specific factor model there are two industries, one is manufacturing, the other is agriculture. Manufacturing is capital specific agriculture is land specific and labor is the mobile factor. So, there are three factors of production two goods and if you talk of two countries you have country a and country b. Country a is say developed, country b is the developing countries. So, then, the capital moves from the developed to developing countries and it comes to the manufacturing industry. Because manufacturing industry is the capital specific industry. So unlike, labor which moved in the short run and it got absorbed in both the industries, when you are talking of capital it gets absorbed in the manufacturing industry.

Now, when the capital comes in (( )) one assumes the law of diminishing marginal productivity, when there is more capital, you will see that the returns to capital go down. So, there is diminishing marginal productivity but, then because you have more capital and so the marginal productivity of labor goes up and when capital comes in the manufacturing industry the output goes up, when the output goes up it will require more of labor that labor will move from the agricultural industry to the manufacturing industry. So, the output in the agricultural industry will go down, the output in the manufacturing industry go up. So, three impact one the marginal productivity of capital goes down, the marginal productivity of labor in the manufacturing industry goes up, the marginal productivity of land goes down, because in the agricultural industry labor moves from the agricultural industry to the manufacturing industry.

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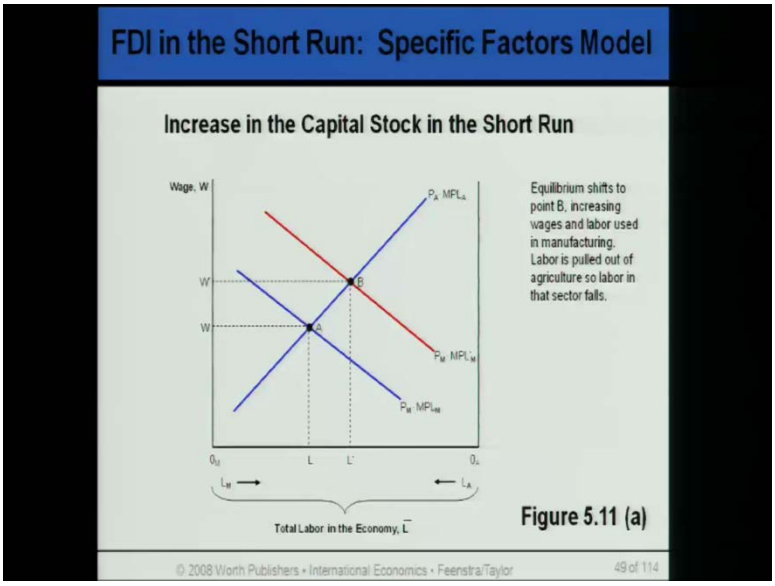

So, we will see happens in the short run you will see that because, now again this is a diagram, where you have the determination of wages you have the blue curve, which is P M into M P L M, which is the value of marginal productivity of labor in the manufacturing sector and you have P A into M P L A, which is the value of marginal productivity in the agricultural sector. Wherever these two curves intersect, you have the determination of the wages. Now see what happens, when the capital moves in the manufacturing sector the marginal productivity of labor in the manufacturing sector goes up, reason that labor now has more of capital. So, the marginal productivity of labor goes up. So, the wages in the manufacturing sector goes up.

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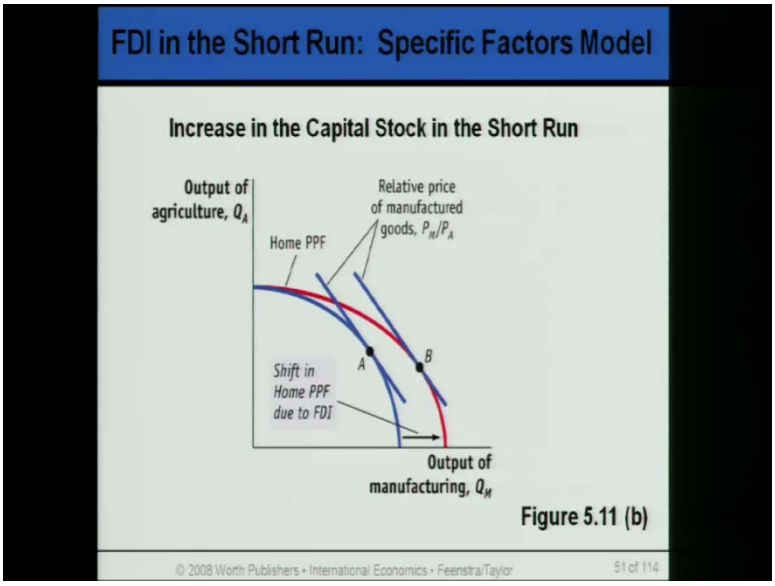

So, as soon as that happens you will see that the there is a shift in the home PPF due to FDI. There is more production of the manufacturing sector and there is a decline in production of the agricultural sector that is the short run impact.

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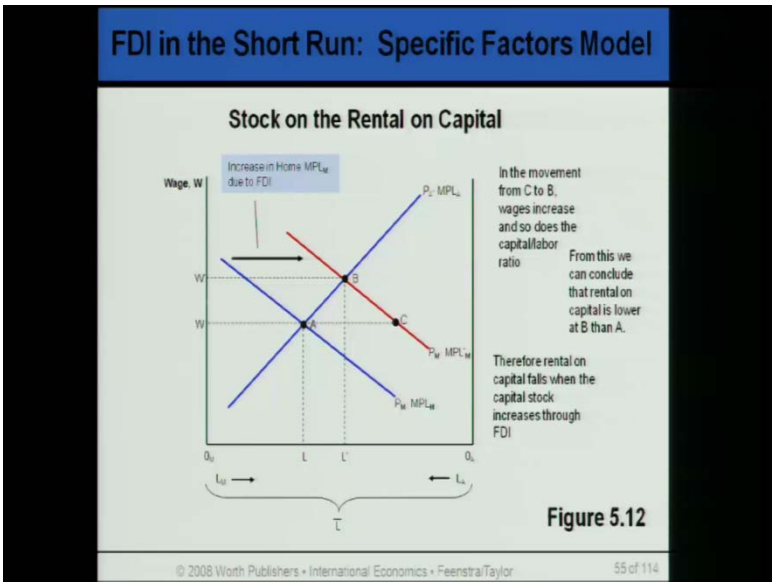

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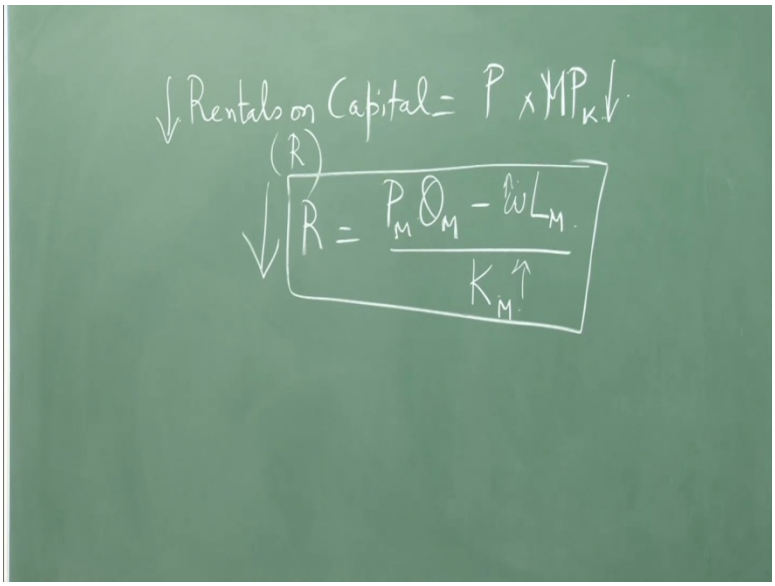

So the rentals on capital fall, because, please recall that rentals on capital can be determined as price into marginal productivity of capital. So, if the marginal productivity of capital goes down, the rentals on capital also goes down. But, there can be another argument saying that, when you increase the production of manufacturing sector then the labor moves from the agricultural industry to the manufacturing industry. Now, that may increase the marginal productivity. So, then there are two forces coming in one the capital S come in from outside, which reduces marginal productivity of capital. But at the same time the output of the manufacturing industry goes up. When the output of the

manufacturing industry goes up, the labor shifts from the agricultural sector to the manufacturing sector, which can lead to an increase in M P K.

So then, one needs to clarify further this point that what will happen to the decline in M P K. Now, this rentals on capital can also be worked out using this formula that it is rentals is P M into Q M that is a total output minus, what you pay to the labor in the manufacturing sector divided by capital, which is used in the manufacturing sector and this is equal to the rentals on capital.

Now you can see that, if the wages are higher than you would see that the rentals on capital will go down. So, if you have higher wages and if you have increase in K K M, if this goes up this w goes up then the rentals on capital goes down. So, even if you use this formula you would see that with F D I in the short run you would see a decline in rentals on capital. Now, what we need to see is empirically whether this holds or not.

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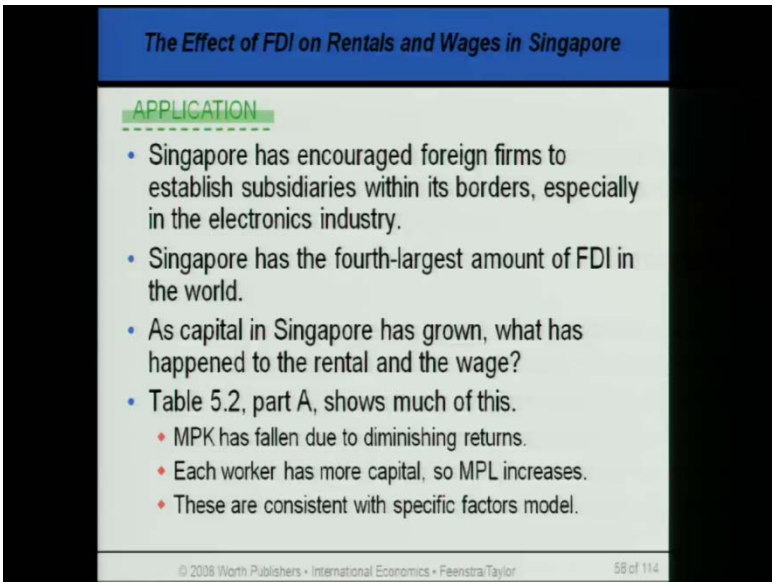

There is the effect of F D I on rental and wages in Singapore. Now, what Singapore did was that, it encouraged foreign firms to establish subsidiaries with its borders, especially, in its electronic industry and Singapore had the fourth largest amount of F D I coming in after say China being the first. So, one need to understand what is happen to the returns to the capital in the short run?

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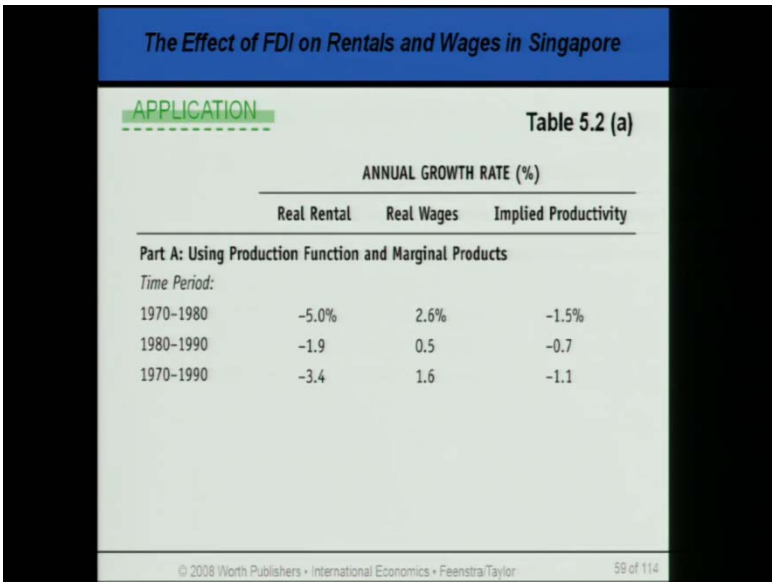

So, you will see that the results are consistent with the specific factor model, you can see that the real rentals have gone down, the real wages have gone up. So, the implied productivity, which is sum of the increase in productivity in labor and capital is nearly 0. But you see that in the short run you would see that incase of Singapore, there is a decline in marginal productivity of capital and an increase in marginal productivity of labor. You can see the real rentals are minus 5 percent, minus 1.9 percent, minus 3.4 percent, while the real wages are positive.

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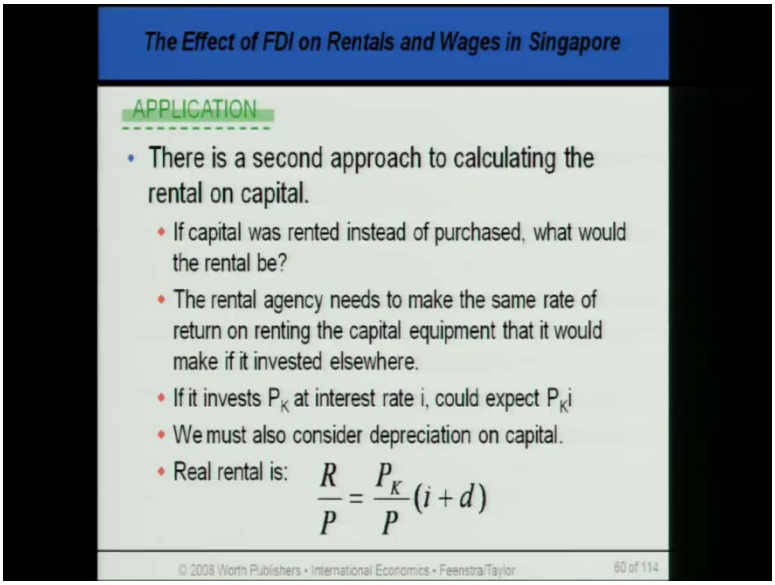

So, the implied productivity is nearly 0 but, then there is a second approach to calculating the rentals on capital, if the capital was rented instead of purchased, what would the rental be? Then the rental agency needs to make the same rate of return on renting the capital equipment that it would make it make effect invested elsewhere. So, if it invests P k at interest rate I, it could expect P k into i as the returns, so and we may also consider depreciation on the capital. So, the real rental this is another procedure to work out the real rental works out to P be the the P K P the returns. So, this is capital, which is rented instead of purchase. So, you have P K and then there is a depreciation of the rate d. So, r by P is P K by P i plus d.

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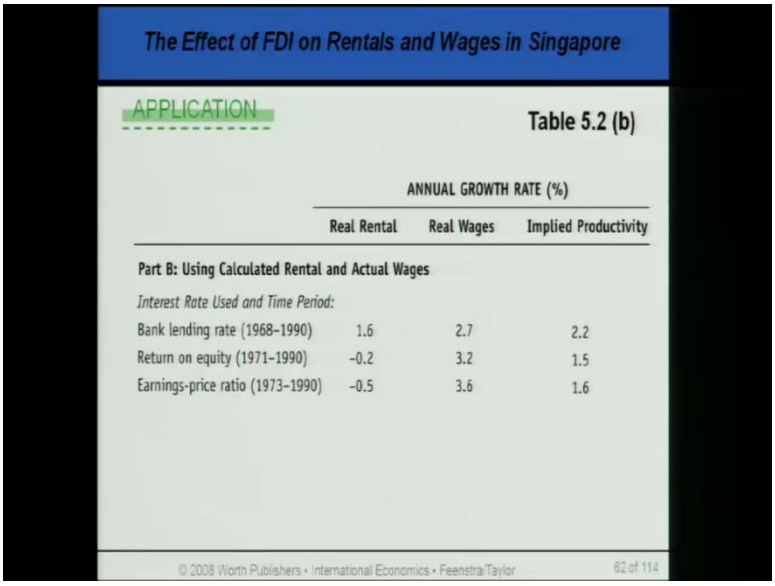

Now you can see, if you assume that then it would show the use the calculated rentals and actual wages the using the formula that I just mentioned and the interest rate used are the bank lending rates, the return on equity and the earning price ratio. So, again in the short run if there is a foreign direct investment coming in the marginal productivity of labor goes down, the impact is negative for the return on equity and earning price ratio and it some positive amount for bank lending rate. But real wages are here it if you work that out, if you calculate the actual real wages, it turns out to be positive.

Now, this table is in contradiction with what we had discussed earlier in the earlier table the implied productivity turns out to be positive. So, on the one hand, one set of figures

are giving a productivity which is 0, on the other hand the implied productivity here if you use another formula turns out to be positive.

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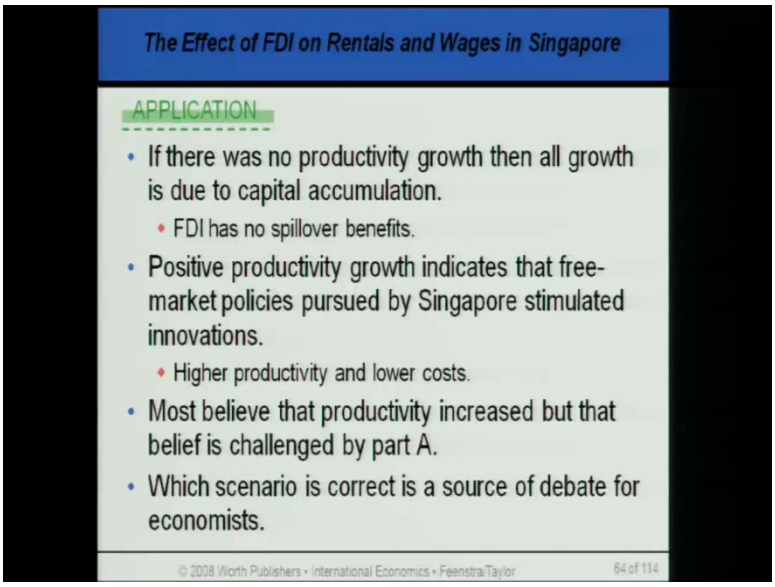

But, then which scenario is correct is a source of debate for economists. So, most believe that the productivity increased but, that believe is challenged by the part A. So, one cannot say for sure with some conviction that the growth that happened in Singapore was it because of the productivity growth or was it just because of the factor accumulation.

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Now, there are some economists like Krugman, who believed that the high growth of the Asian economies is not very different from the growth of Soviet Union in the 50's and 60's. It was more due to factor accumulation. So, if it was more due to factor accumulation, it would eventually lead to a decline in returns. If one believes in the diminishing marginal productivity, so growth will eventually come down and Paul Krugman was writing as before he was writing this in the mid nineties and then you had that major east Asian crisis in nineteen ninety seven, where at least five major east Asian economies were impacted in the month of June of nineteen ninety seven around one fifty billion U S dollars moved. Out of these five countries, as a result there was an impact on the exchange rate. The exchange rate depreciated heavily, it had an enormous impact on the inflation there was a deceleration on the output. But this was ninety seven but, Krugman could predict this writing in journal called foreign affairs in nineteen ninety four and his concern was that probably the Asian economies growth is due to factor accumulation rather than productivity growth. But there is a whole debate on this whether it is factor accumulation or is it productivity growth. So, other economists disagree and believe that Asian growth is due in significant part to improve productivity in addition to capital accumulation. So, then the other view the third view is that it is both because of factor accumulation and an increase in productivity.

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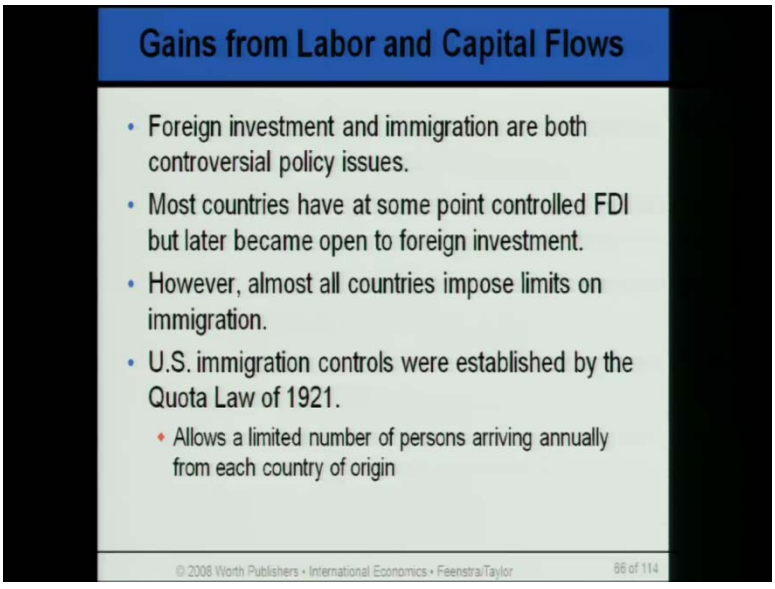

Now, the gains from labor and capital flows, if you look at the foreign investment and immigration are these are both controversial policy issues. So, most countries have at

some point controlled F D I. But later became open to foreign investment. However almost all countries impose limits on immigration the like the U So, they have a immigration control which was established as far back as the quota law of the 1921 say it allows a limited number of persons arriving annually from each country of origin, if one wants to understand the gains from immigration.

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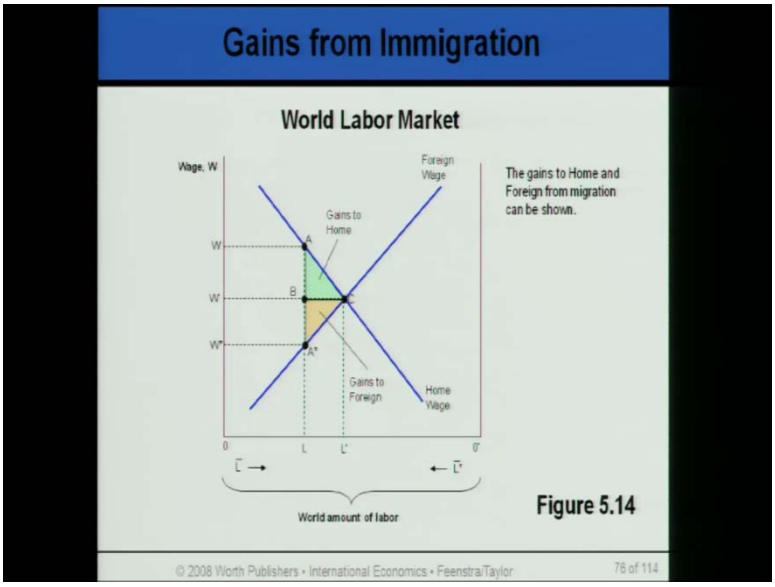

Now, this is a diagram which would show the gains from immigration for both the home country and the foreign country. So, it is both the host and the source country, which gains from this process of immigration.

Now see what happens, A W is the wage rate, which is prevailing in the home before immigration. W star is the wage, which prevails in the foreign country before immigration and naturally because, you have a lower wage in the foreign country. There is an incentive for the foreign immigrants to migrate to the home country is the developed country. Now, what are the gains to home? Now, the last individual which immigrate she gets a wage, which is equal to P into M P L. Now see what happens, when immigration takes place or emigration takes place eventually, you will see an equalization of the wages in the very long run. So, eventually the wage rates that would prevail will be W, where the demand and supply would be equal and then it will be like an equilibrium situation.

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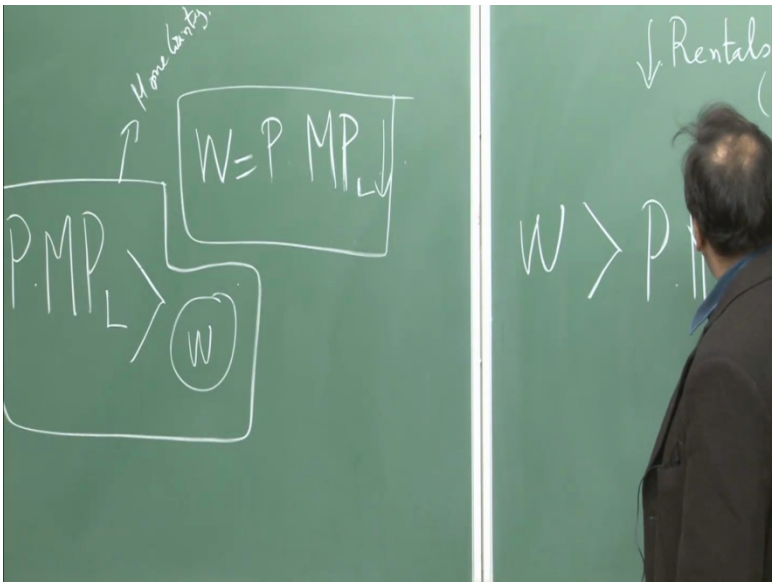

Now, compare the wages of the people who are coming in the home country, what they get is price into M P L. So, the last person, who has immigrated from the foreign country to the home country will get P into M P L. Subsequently, because there is a diminishing marginal productivity taking place M P L will go down. So, what you would finally get is that the wages which prevail are Wand the foreign immigrants, which have come in P into M P L ratio is greater than the wages, which prevail in the home country because, what they are getting is P into M P L.M P L is declining but, the wages that they are paying is W because that is the equilibrium level of wage. So, the gain to the host country is that the contribution P into M P L. Their contribution is greater than the wages that they are getting. So, in that sense home country gains, what is the gain to the foreigner? Remember foreigner started with wage rates W star and eventually, what will be the wages that they would get would be W and W is greater than the P into M P L that would prevail in the source country. So, this is the source country the gains are because the wages that the emigrants get is greater than what they would have contributed back home, which is P into M P L. so, then the gains to home is a b c, the gains to foreigners is b c a star. So, the entire gain from immigration is the triangle a a star c.

Now, if you wish to work out the area of this triangle you already know the area of the triangle is half into base into height. The half base is the difference in the wages that prevailed between the home and the immigration which is W W star. The height is the line b c. So, you can always workout the area of this triangle one can always go into the

detail of it. Similar analysis can be done for the gains from foreign direct investments the gains are now here because, the rentals in the foreign country are higher than the rentals in the home. The capital moves from the developed nation to the developing nations.

So, in this scenario the gains to the foreign are a dash b c, while the gains to home are a b c. So, this is similar to the analysis on the gains from the foreign direct investments. So, all in all let me try to recapitulate it the issue of immigration and foreign direct investment. It is a little sensitive issue but, if one believes in the economic forces then one can say that immigration and foreign direct investment in the long run tends to have an impact on output, rather than on the wages and rentals on capital.

So, to understand the impact of FDI one needs to understand, one needs to take a longer time span to understand the impact of FDI and then this analysis is a partial equilibrium analysis. If you wish to analyze the FDI impact on the entire economy you have to bring in the other impact, the other sectors you have to work out the spillover effects the backward and the forward linkages that would require another set of data set. To say something more on the impact on the on the entire economy but, then what this analysis has shown that when people say that more of immigration leads to a decline in wages that may be true in the short run but, in the long run it will have an impact on the outputs output of say labor intensive industry will go up, the output of the capital intensive industry will go down. So, I will end up here and we will take up our last lecture next time. Thank you so much.