Strategic Trade and protectionism - Theories and Empirics

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Lecture – 11
Neoclassical Trade Theory- Standard Trade Model

Welcome to the module on you know Strategic Trade and trade facilitation. Especially a discussion on the protectionism you know theories and practices where we are discussing now on lecture number 11 specifically to identify the theories. The classical theories to the neoclassical theories, who suggested number of you know, theoretical based you know modeling to identify the issues which were actually very important in the present day discussion as well.

So, the today's class is on Neoclassical Trade Theory and we are on the third week of the all the sessions. And on the third week we are supposed to start with the foundation of the new classical trade theory is called standard trade model. Where there are number of you know models in under the neoclassical theory. So, let me you know discuss in detail; so, myself Dr. Pratap Chandra Mohanty; faculty member in Department of Humanities and Social Sciences.

Now, since we are having a departure from the classical to the neoclassical. And the neoclassical certainly relaxes number of assumptions, which are quite unrealistic in the classical setups. Now, in the previous lecture, even in the you know earlier lecture let me just recapitulate for a few minutes. That they broadly discussed on pool employment issues they broadly discuss on no restriction they do not; I mean emphasize the role of public or the role of the government. And largely they believe on free market mechanism based on the situations.

And there were a number of you know interpretations to identify complete specialization in trade. So, is it still valid in the neoclassical setup, to be verified in detail. Now, in the neoclassical set up, we must start with the difference to the classical one. First and foremost important aspect of this particular theory is relaxing the assumptions and emphasizing you know one of the very realistic assumption of production function called increasing opportunity cost of production where the production function exhibit in nonlinearity structure. In reality it is not at all you know exhibiting constant cost function throughout.

So, there is the departure. Another departure from the classical is due to the fact that you know they said there will be complete specialization and therefore, one country will be you know producing one product and leave off another product to be produced in another country. But, you know this is not enough you know this is fine in competitively trade should take place based on these regimes.

But there are gamete of other factors which are responsible for explaining the trade model. And specially in these neoclassical set up one thing is very important, if and if the prices the relative prices between two countries are same you know I am you know making it code and uncode; even if they are same, but still trade is taking place or trades takes place because of differences in taste and preferences or differences in demand patterns.

If a country can able to produce a product which is similar to another one in terms of the market prices relatively, but the domestic country actually demands the products of another country largely. So, another country will be happy to export it since we cannot able to support our domestic demand. Like you know this is basically, explaining small country versus large country context.

And also discuss these things in these two modules on today. And there are other aspects to it as well we will explain steadily. So, relaxing assumptions are very important as I mentioned and we also discussed this slide earlier as well.

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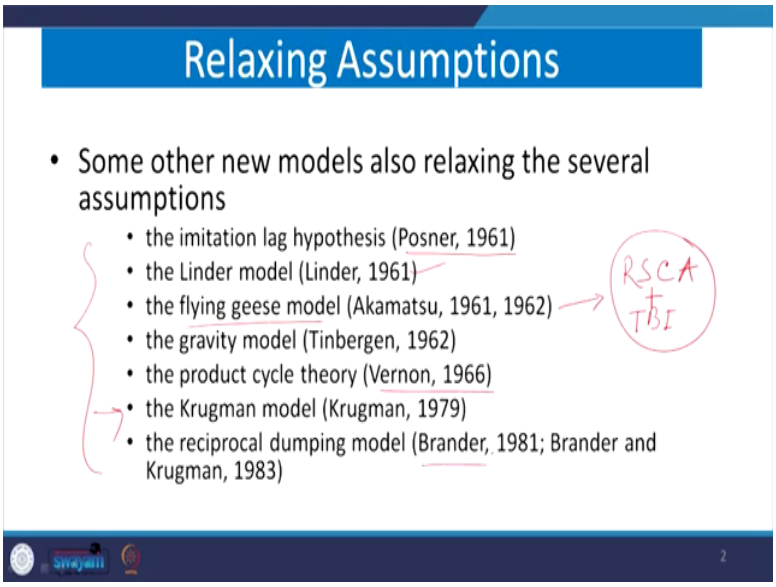

Now, but still to reemphasize to recapitulate further for our you know potential demand for the course ah. We must actually understand what is going to be discussed in couple of other lectures. So, imitation lag hypothesis prescribed by a Posner in 1961, Linder overlap in demand by Linder in 1961 again on the same year; the flying geese model we have already categorically explained emphasizing the fact that how a flying geese on the sky can describe different you know setups.

You know, we discuss reveal systematic, competitive advantage plus trade balance index by combining is these two together. We explained how a country can relatively take the advantage this has emphasized during our you know competitive cost model in the previous week. Similarly gravity model will take it forward for sure where the geographic distance and the agglomeration effect are important.

For trade product cycle theory by Vernon is very famous 1966, Krugman model we will you know discuss in detail emphasizing the scale economies and its rho on trade. Similarly reciprocal dumping model by brander strategic trade by brander and Krugman also will be discuss in some of our you know other lectures.

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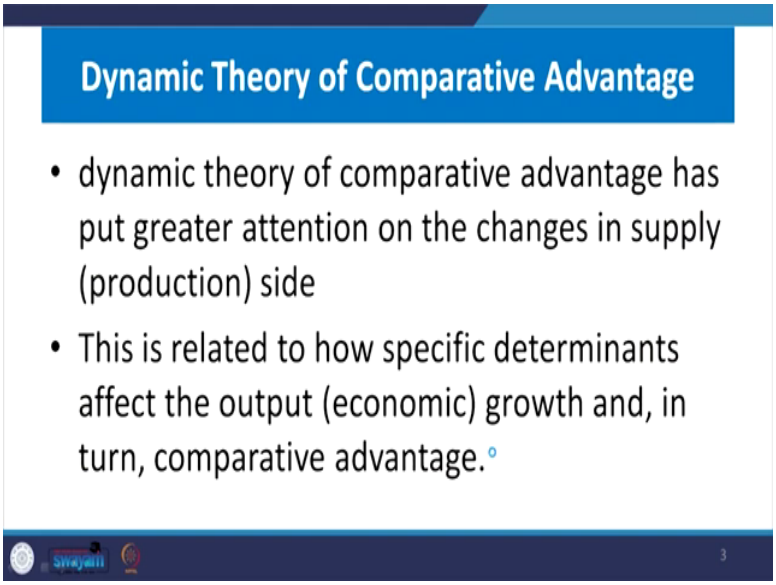

Now, let us you know compare what we have discussed in the previous class on dynamic theory. Is it actually part of the neoclassical setups? Dynamic theory of comparative advantage actually has given huge attention on the supply side of the story.

So, where the supply as a function of so many factors accordingly the quality the production function get changed. So, therefore, the output of the product actually changed. And

accordingly there are differences in the relative prices or difference in the taste and preferences. So, over there are possibilities of trade.

Especially in these you know two lectures we will be discussing on factory endowment and their differences, which is largely a part of supply side storage of cases. So, this is you know also related to specific determinants, which actually affect output growth and in turn emphasizing the comparative advantage. And dynamism here because of the fact that they are not just in one time period there are changes examined over time and the impact of trade actually you know gets understood.

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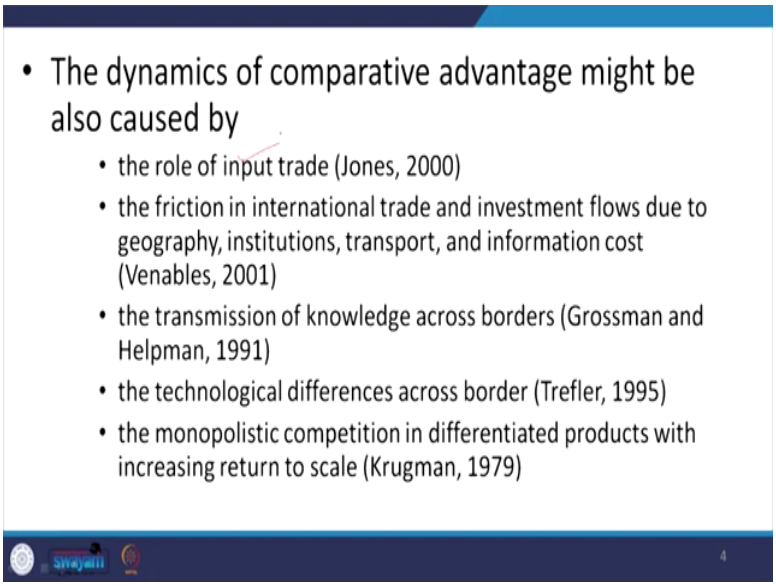

So, dynamic comparative advantage so might be caused by so many other factors like as we discussed already input role of inputs as emphasized by Jones. And you know investment flows or the friction of the flows of trade, transportation information costs differences

knowledge across the borders. Then also very important in the present days due to technological differences and monopolistically competitive markets; we generate differentiated products is emphasized by Krugman's model where the scale economy is being emphasized will be discussed in detail.

Now, then what is you know discussed largely on the standard trade mark? The first premise, which is very realistic, actually not we should not simply say premised rather we may, say the features of these neoclassical you know production function. Or neoclassical trade theory where the production function is considered to be very realistically defined as called or as a function of increasing opportunity cost.

So, therefore, there exhibit diminishing returns to scale which is very real and its the eventual occurrence in almost all the production function. So, what do you mean by increasing opportunity cost? Opportunity cost we explained in our previous lecture in our previous week where we discussed that you know the opportunity cost is the next best alternative cost which has been (Refer Time: 10:01). So, what is the exact implicit cost or explicit cost which have been (Refer Time: 10:05) that net cost are actually captured through opportunity cost.

So, if a country actually you know produces one variety of product, then the country is supposed to you know forgive other; I mean the resources which are useful for the production of this to other production. So, there are possibility of give up possibility of give up or you know opportunities which are not tapped or actually sacrificed.

So, therefore, the you know the cost of production of the present good is a function of the cost of the resources which have been used to utilize or not utilize for other purposes. Or utilize for these purposes as against as trade off to all the products which are not utilized.

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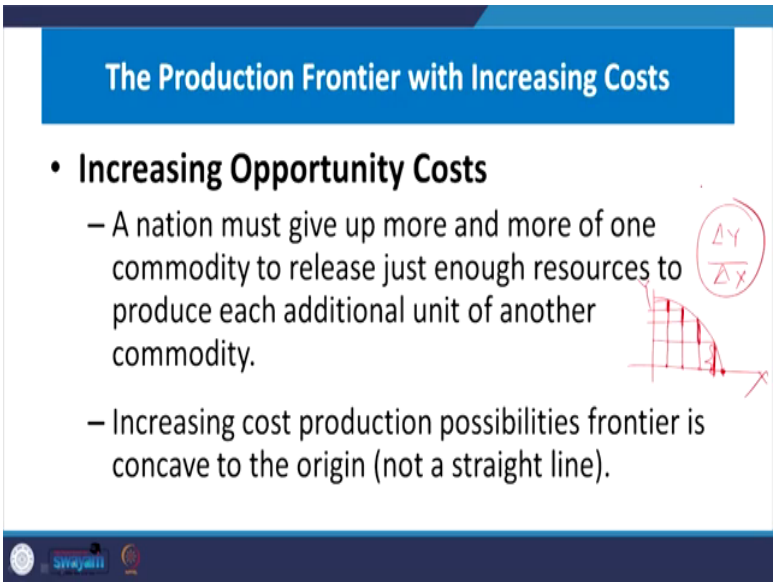

So, in short nation must give up more and more of one commodity to release just enough resources to produce each additional unit of another commodity. So, increasing production possibility or the increasing cost production possibilities frontier when we assume it the production function exhibit increasing opportunity cost.

So, the production function or the PPF production possibility frontier we discuss in generally the microeconomics syllabus or microeconomics paper, where it is not straight line; because you know every time if you want to add one variety of commodity there exist diminishing returns due to increasing cost function. So, the you know the distance the extent of sacrifice in another axis gets declined.

So, we can explain here in short by putting it like this like this. So, make equal distance everywhere to understand correctly now this, now this. So, if you plot it will mark the

difference look at these distance, these distance, these distance and these distance. So, this is certainly greater than that of the previous extent of you know change in another product let it be Y this let it be X.

So, how much Y actually we sacrifice to add one unit of extra of X? So, therefore, it is concave to the origin since it is attached with increasing opportunity cost of production. So, this is actually the foundation stone of the new classical framework ok. So, there might be a number of questions on it comparing classical to new classical. And how the trade models are actually interpreted and how a strategy are actually derived right.

So, various I mean simply define the strategic trade as define in the classical economy or as mentioned in the classical economist or how it is actually explained in the new classical you know regime.

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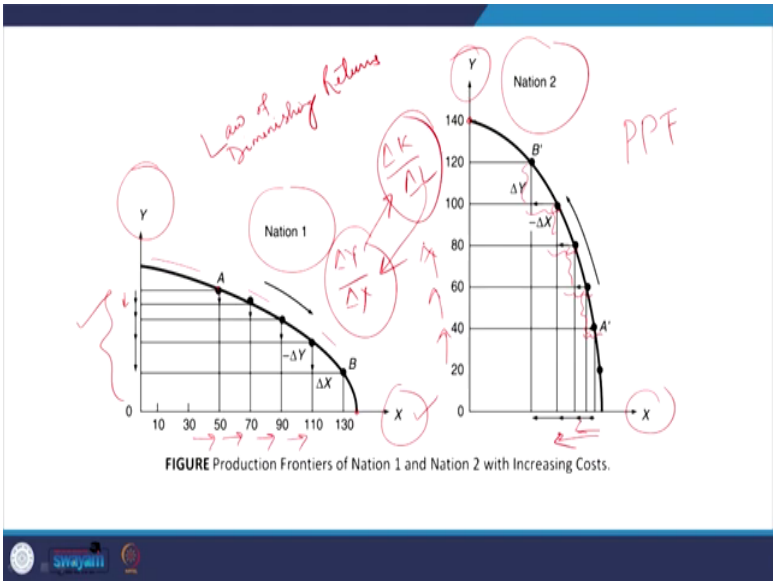

FIGURE Production Frontiers of Nation 1 and Nation 2 with Increasing Costs.

So, let us explain it here, once again let this be the production possibility frontier, the maximum possible production which is possible by utilizing all these resources maybe labor and capital or all of the resources to optimally allocating its resources to X and Y. So, that the optimum possibility of production is possible. And the boundary point if all the points are connected called production possibility frontier.

So, these may be for nation 2 these may be for nation 1. Now, from this diagram, we can easily infer one of the important aspect that is look at the gaps as mentioned or highlighted by the arrows. And the extent of change for every additional 20 units of X 70 to 90 the extent of change is actually increasing in nation 1 only because Y more resources. More resources of Y to be sacrificed you have to add the same variety of X and this is largely due to law of; law of diminishing returns; law of diminishing returns, which we discuss in microeconomics lectures.

Now, similarly a nation 2 for we let assume that nation 2 wants to have more of Y; because they are their resources are more endowed towards Y whereas, our resources are more endowed towards X, maybe we have more endowment for X type of production.

So, therefore, you know if nation 2 wants to add extra 20 every time. So, nation 2 should give up the resources which we are earlier allocated for X. So, now, the extent of you know this is increasing it is highlighted by the arrow even the gap can be marked here ok.

And you know gap sorry this is not the vertical distance we need to you know took over the horizontal distance because we are sacrificing X. So, these gap, this gap, this gap and this gap ok. So, it is highlighted in the horizontal axis. So, this is the production possibility frontier PPF; PPF we are discussing and the slope what is the slope of each of the points each of the point on the production possibility frontier?

This is basically the rate of change between delta between Y and X. What do you mean by this? So, indirectly we are we are explaining the extent of resources which are useful for Y; now we are diverting for extra unit of the production of X.

So, basically we are sacrificing the X and I mean in order to produce Y and X, where I actually indirectly sacrificing delta K by delta L different type of resources for. If X is largely useful for production of X varieties and X is largely labour intensive then accordingly we can present it and our next slide will guide you differently.

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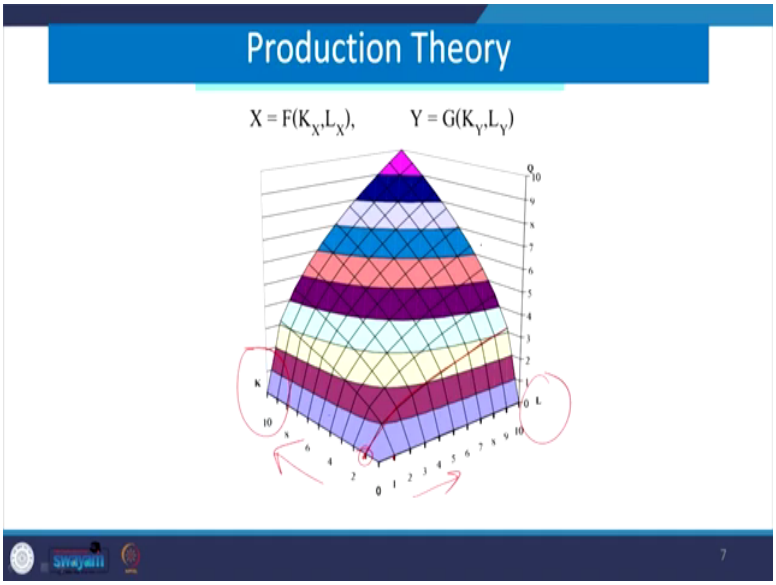

Now, in this slide this is you know you know diagram 3 dimensional diagram, where this is labor this is capital this is simply a production a function explained in a graph. And if both are you know dynamic not fixed the both are changing, then how keeping in only labor is I mean capital is at two level then its production increases like this with the change in labor similarly at different level it get changed. Now, you know if capital is fixed then we can define differently and we can plot it in a 2 dimensional figure.

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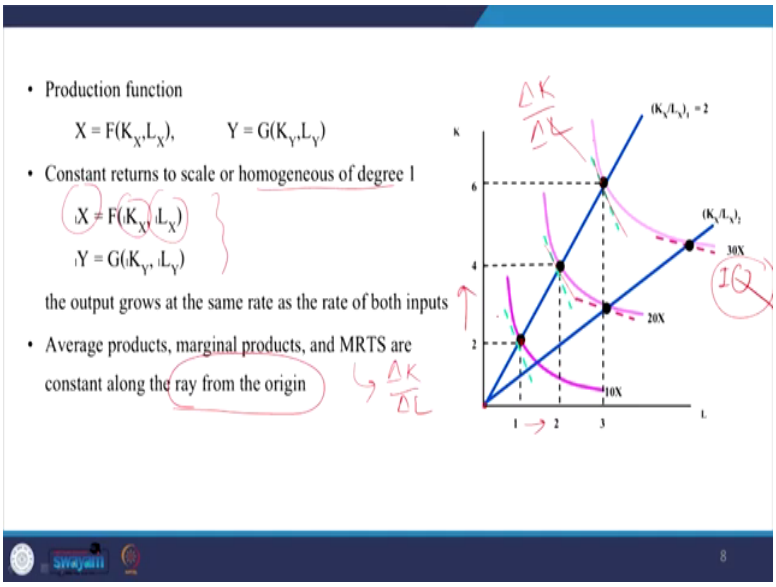

So, and that one usually explained with the help of isoquants these are the isoquants or the you know isoquants we usually discuss in our microeconomic syllabus, these are called equal quantities in all the places. The combination of labor and capital we should be allocated in such a manner that the best possible quantity our production should be generated by utilizing its resources effectively.

So, that I mean the theory suggest that these are the isoquant which maps the best possible combination of labor and capital and gives a maximum output at that level. Now, here if the production function is you know K and L for X and K and L for Y here we can define a constant return to scale or the homogeneous of degree 1 to the. I mean constant returns to scale or which is homogeneous of degree 1 can be explained by like this, if we changed by 1

unit of X 1 unit of K and 1 unit of L 1 unit is here the total output will be changed by 1 unit. So, the output goes at the same rate at the rate of both inputs.

Similarly when the constant returns to scale exhibited average production marginal products and also are also constant. So, that is also called marginal rate of technical substitutions which is basically rate of technical substitutions basically delta K by delta L are also constant along the ray from the origin. So, there will be some places where the slope will be same slope is basically delta Y delta K by delta L ok, every variety is same if we start a ray from the origin. And why ray from the origin gives you know same almost same one same you know average product marginal product.

And also exhibiting constant you know returns to scale because of the fact that this gives a proportionate change this side and this side. So, 2 by 1, 4 by 2 are actually same ok. So, what are the proportionate change in the you know factors of production, which will give you the equal rate of change in the total output is there important to be discussed in the production function.

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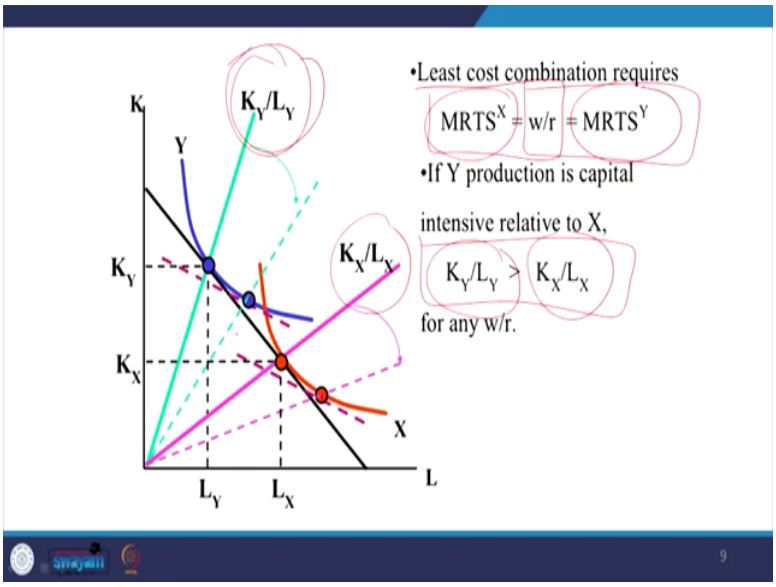

Now, here we are saying that how to reset the least cost combination, if you have both the products to be produced. So, one is for X marginal rate of technical substitution which is basically the slope of you know a delta K by delta L and for Y if they are attached with the minimum of ratio of cost function. So, if these two are equal and these two are equal, then we know from the microeconomics theory that we are we attended the least cost combination of production.

So, if Y production is capital intensive to X, then relatively we are using more of you know K for Y and less of you know K for L as against for X. So, these two difference the intensiveness of a particular you know product can be understood. Now, the other two axis by which we can understand here X and Y.

So, X utilizes you know X utilizes more of labor comparatively where you know Y products utilizes more of a capital as a factor relatively higher as compared to X. If there will be any shift of the of you know scale of production we may land into another point, if again the ratio remains same the you know MRTS remains same we will we are also attending the least cost combinations. So, therefore, the slope important.

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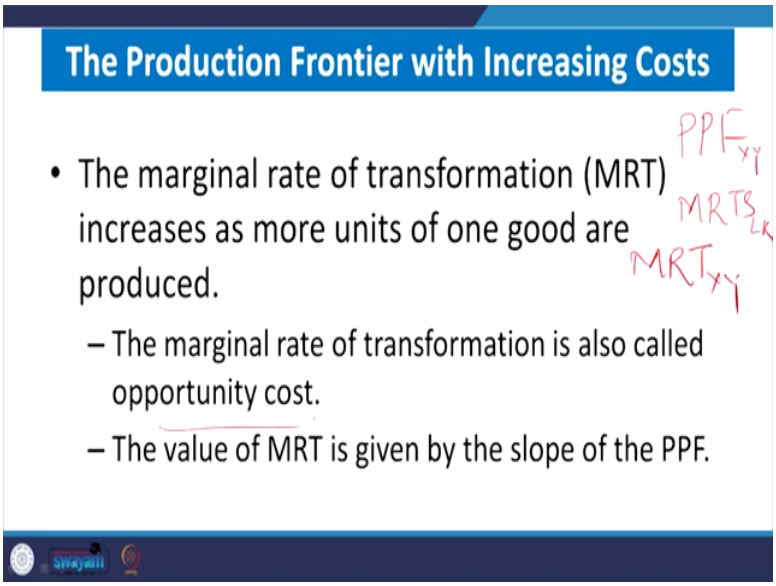

So, production function with increasing cost, which largely explained by m you know especially in Production Possibility Frontier PPF; we explained this with the help of marginal rate of transformation. In the you know production function we say marginal rate of technical substitution between labor and capital. Marginal rate of technical substitution between L and K where here we are saying it is between X and Y. In PPF we say you know MRT; MRT in PPF we say marginal rate of you know marginal rate of transformation between X and Y. So,

marginal rate of transmission is also called opportunity cost. So, the slope is also called opportunity cost.

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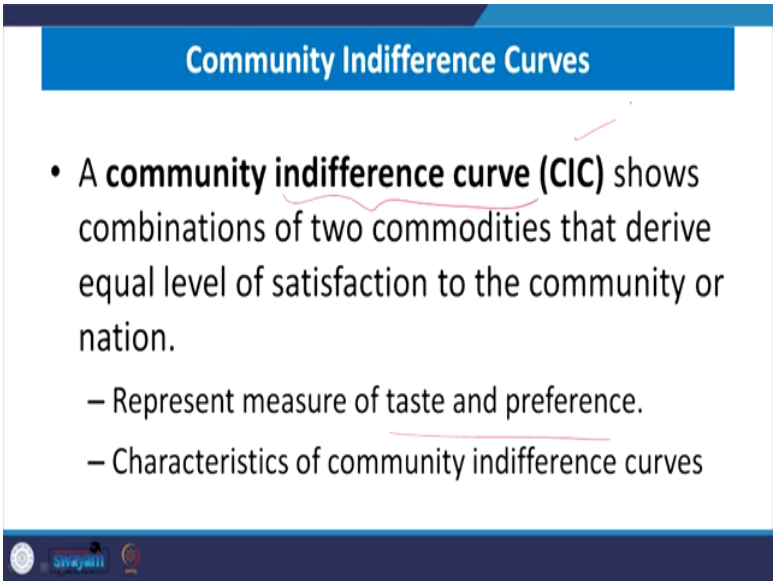

So, the value of MRT is given by the slope of PPF which I have all explained. Now, what else is required? In this new classical set up another thing is very very important to be explained called the community level of engagement in the production function. Especially for the demand and the its not individual demand how the total production is produced by the you know a production unit are actually demanded by the community.

So, these are explained similar to the argument we explain understood in microeconomics called indifferences curve analysis. The combination of two commodities which give equal level of satisfaction to the consumer, if you plot all the consumers on aggregate we will find a community indifference curve which largely measured taste and preferences. And it usually

gives characteristics of a I mean usually give you know the demand pattern. So, then what are the characteristics of Community Indifference Curve, CIC? This is this would be like indifference curve, it should be downward sloping.

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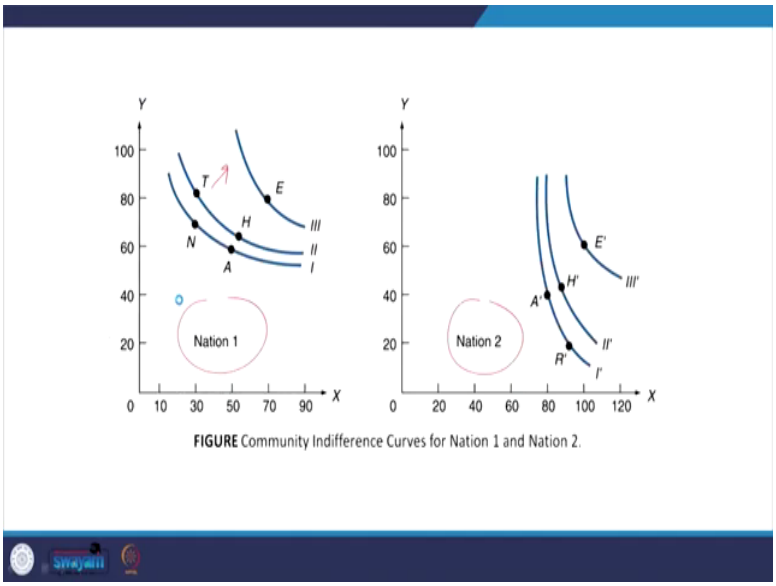

FIGURE Community Indifference Curves for Nation 1 and Nation 2.

I will explain it here it should be downward sloping, it should be convex to the origin; no two indifference curve or the commodity indifference curve should intersect each other. Higher the indifference curve, higher the level of taste and preference or satisfaction. So, let us assume that these are the two you know level of community you know indifference curve we have in two countries nation 1 and nation 2. We will discuss use it in our diagram.

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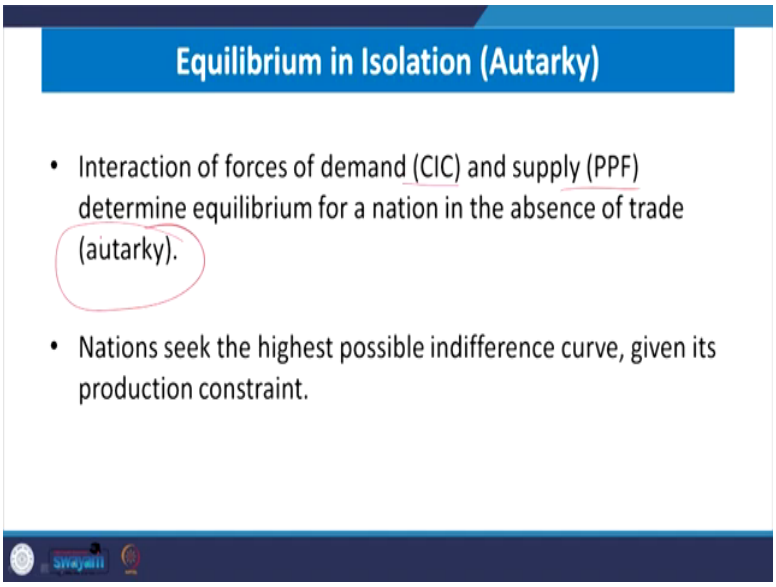

So, we will simultaneously request CIC Community Indifference Curve and supply curve that is sure for us it is you know PPF Production Possibilities of Frontier. Now, these two will determine the best possible level of equilibrium and in the absence of trade absence of trade a term is called autarky. Autarky where there is no trade takes place. And we can define the domestic equilibrium situation.

So, nation actually seek the highest possible indifference curve given its production constraints. So, always the nation or the community and its persons always is to have landed in a higher possible basket of commodities given its production constant we will discuss.

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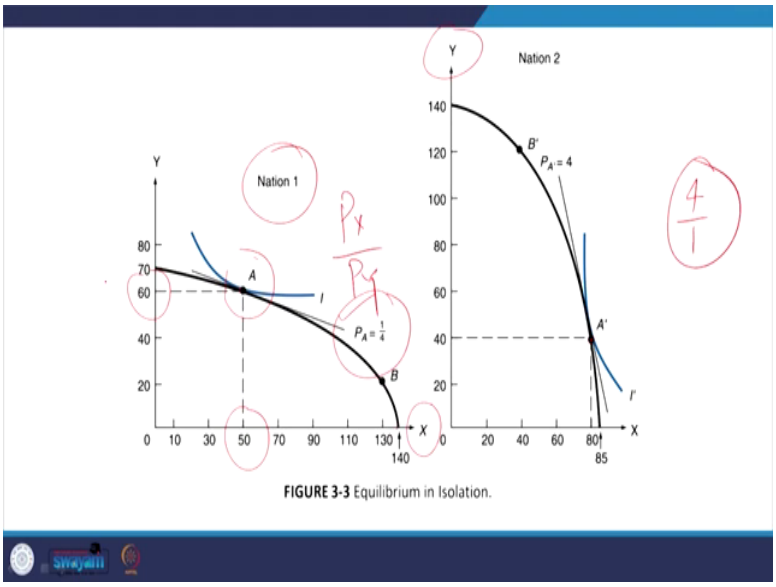

FIGURE 3-3 Equilibrium in Isolation.

So, this is let it be the place where both are merging at point A; this is the autarky point. Here this is for nation 1, this is for nation 2, this is called autarky A A prime is the autarky point in nation 2.

So, accordingly they have their different production. Now, another thing is important here these nation 1 is more endowed with a commodity X, where nation 2 is more endowed with commodity Y or the factors which are responsible for production of each of the products.

Now, given its endowment the price I mean the production of X and Y and its a rate of substitutions for its factors can determine the prices of those transformation. The MRT and its slope defines differently and its it defines as like you know the slope of the cost of production cost of X and Y and these X and Y can determine the exact clarity of production relatively.

So, the relative differences are like this mentioned here is, the slope and it is one four; as compared to just the difference; I mean basically this is P X by P Y price of X divided by price of Y ok. So, price relatively the price of X we have already defined the slope of this one is called price of X and price of Y. And because the I mean because you know X is more endowed in country one.

So, country one can able to produce more and in the pre you know trade period or in the autarky situation. So, relative price of X will be lesser. If there are only 2 nations so, if it is one fourth in country one so, it should be 4 by 1 in country 2 this is called terms of trade as well terms of trade of exchange between two commodities or between two countries.

So, accordingly there are possibilities. At this moment we are defining their domestic demand how much they you know consume and also produce.

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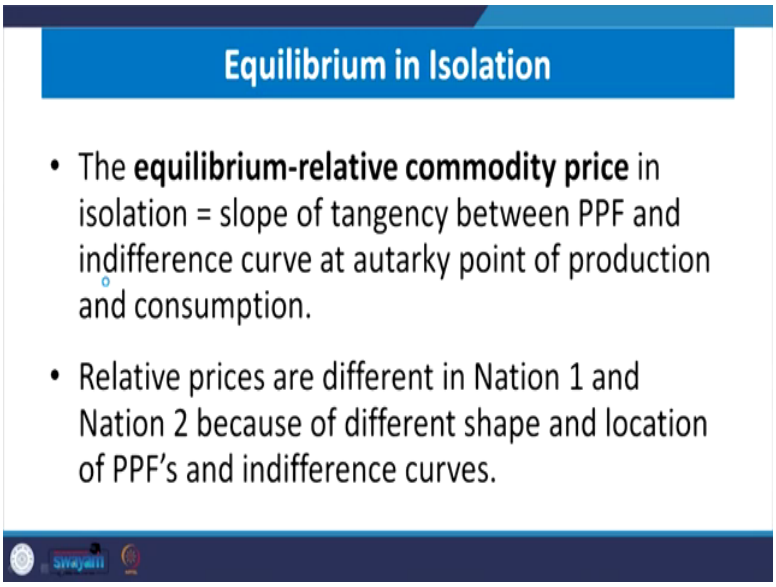

Let us open the market to the world and try to understand how the you know new classical production function explain things in a you know detailed manner. Now, so, basically the slope of these two should be equal and that will define the best possible allocation of resources and in special in the autarky point.

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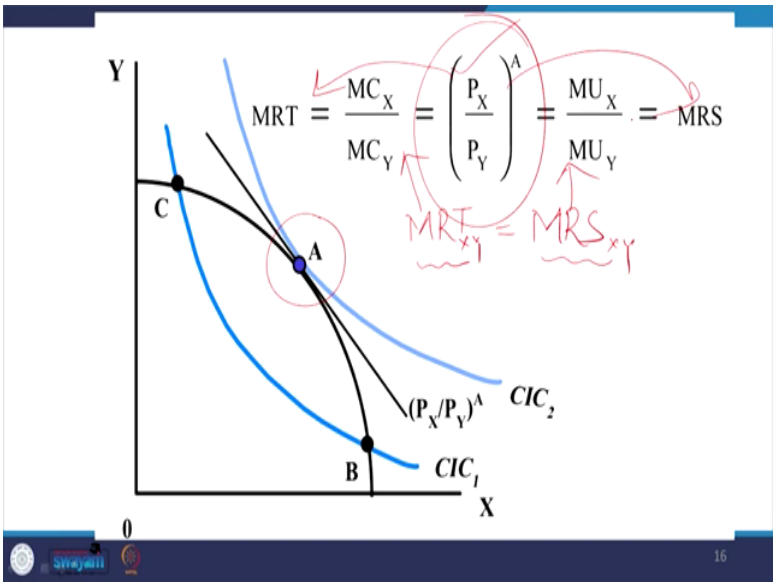

Now, in order to have a or the autarky point defined MRT Marginal Rate of you know Transformation should be equal to marginal rate of substitution between X and Y. This is X and Y, this is basically the supply side, this is basically the demand side which are exhibited through the community indifference curve. And this is explained with the help of this one and this is explained of with the help of its cost function and cost function reflected with these prices.

So, ultimately both should be equated with the prices, because these prices or the relative difference between the price prices or the ratio of prices are actually important for the producer this is also important for the consumers. So, we must understand wherever the slope are similar or same or the equilibrium best equilibrium point defined at the autarky situation.

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So, we have already explained this. So, each nation should specialize accordingly based on their endowment and availability of the resources and demanded with in the country. So, specialization will continue until relative prices equalized between the two nations once trade is opened up or trade takes place.

So, two country nation 1 and nation 2 will try to exchange their product. And once you know there is different demand reciprocal demand across different places there will be more demand for the products. So, prices will rise price of the product will rise and relatively you know, it will be equated ah between the two prices and the specialized you know will be continued till that point only ok.

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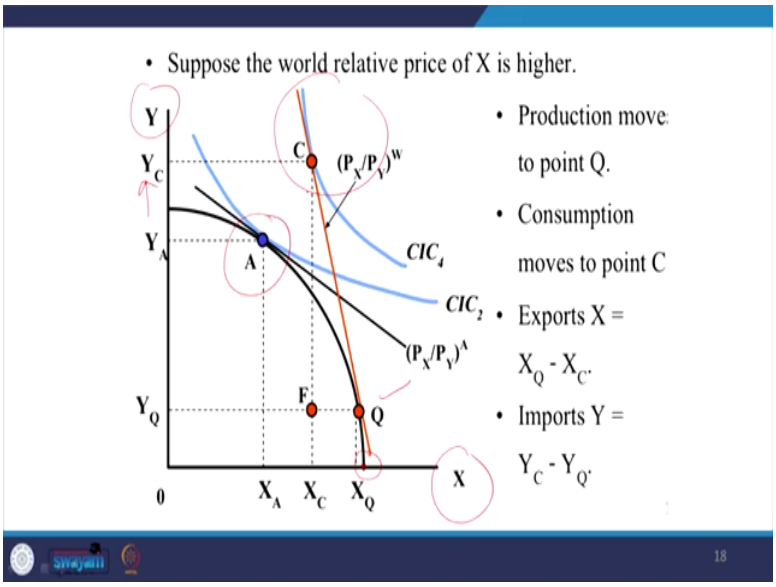

So, what we have inferred out of this diagram, another one important features is specialization in complete versus incomplete specialization. We have a detailed session for this later on in our other week lectures, where there will be no corner solutions because of the fact that two products are imperfectly substitute to each other. And those products are very much normal by assumptions and that to the production function exhibit nonlinearity, which is the assumptions of the a new classical setup.

So, there will be no corner solution. So, there should not be you know a complete specialization or no complete production of X only or Y 0. So, each country will try to you know produce some of their products. Now, here what we wanted to say after trade initial phase autarky situation is here, after trade the relative price might rise due to you know reciprocal demand or demand in other countries. So, price level will rise.

Now, when the price level increases, the country might redistribute that income to its domestic consumers and which is a you know help them to have higher basket of other communities as well. So, they will land in a higher point. So, it will be better for the countries.

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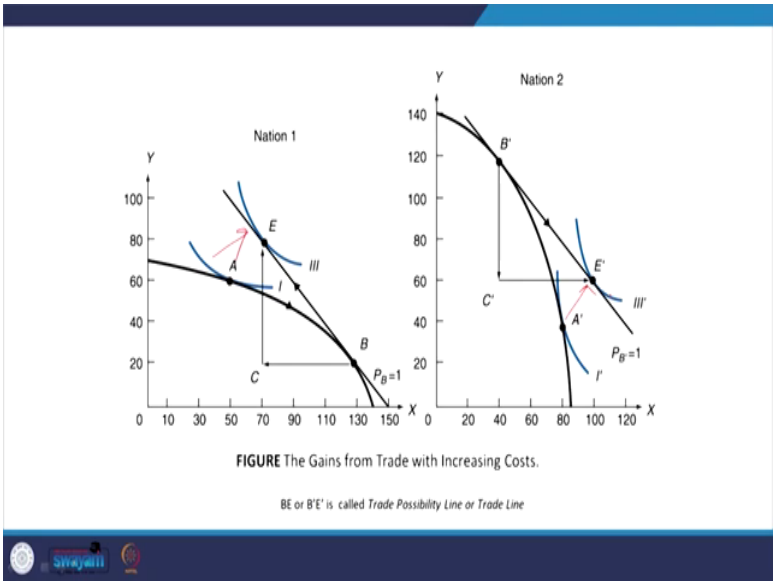

FIGURE The Gains from Trade with Increasing Costs.

BE or B'E' is called *Trade Possibility Line or Trade Line*

So, these are this can be explained for this is to here, this is to you know for you know initial phase to another phase initial phase to another phase. So, country both the countries will be benefited out of it ok.

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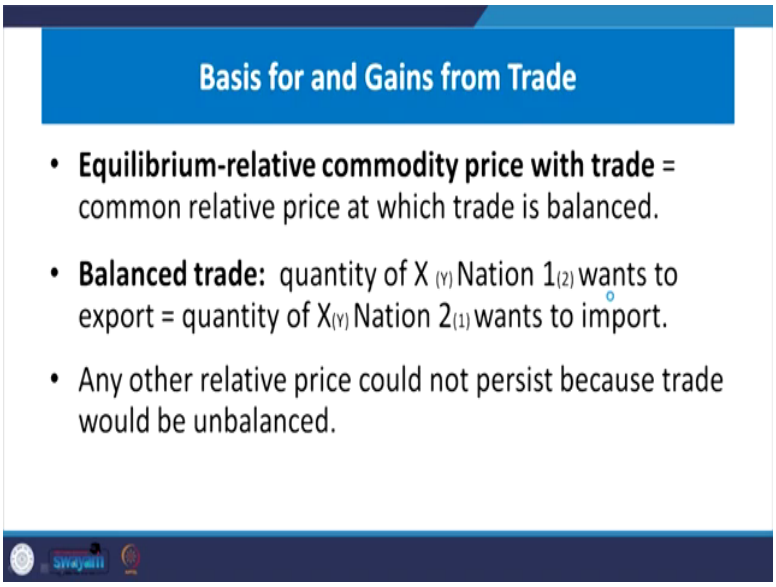

So, now so, equilibrium you know relative commodity prices with trade equal to common relative price, which I have already explained in the previous diagram.

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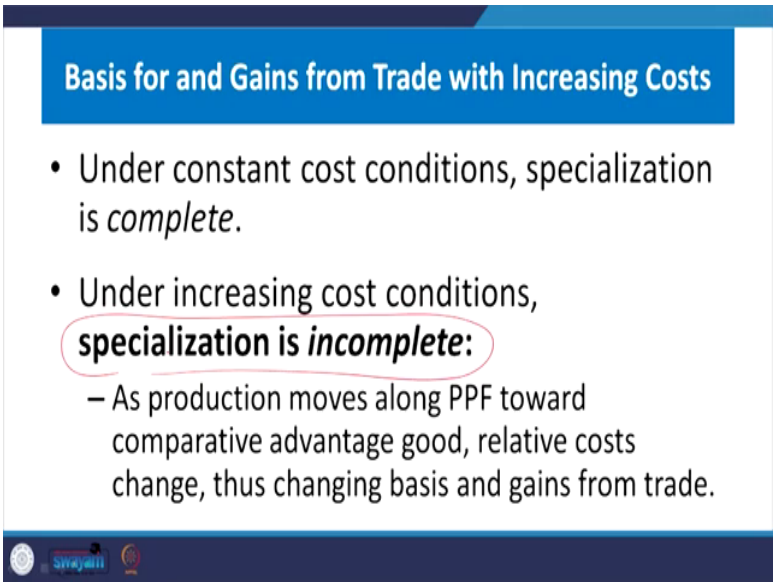

Let us move on to a further discussion we have already discussed that there is no complete specialization possible, if both the countries are large enough to define their stake. And what we try to mention here is the following.

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If it is a small country nation, now if both are large country, then complete specialization not possible given the assumption even the realistic assumption I have already explained in the diagram. With the small country then probably the they do not have that much endowment. So, they cannot specialize in both the products.

So, and they cannot even you know support the total production to another country. Under constant, cost complete specialization occurs so, but large nations continue to produce both commodities even with trade a small country could not satisfy the demand for the large nations. So, large country will continue to produce both.

But in case of this still small country would get advantage by exchange at the price ratio and may not specialize. And large country take advantage by exchange as well as specializations. Large country will exchange their products to another country as well as they specialize.

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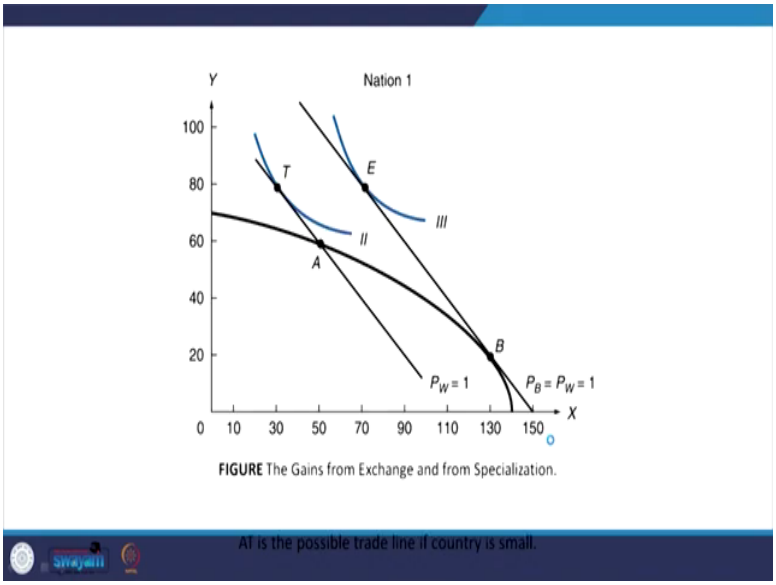

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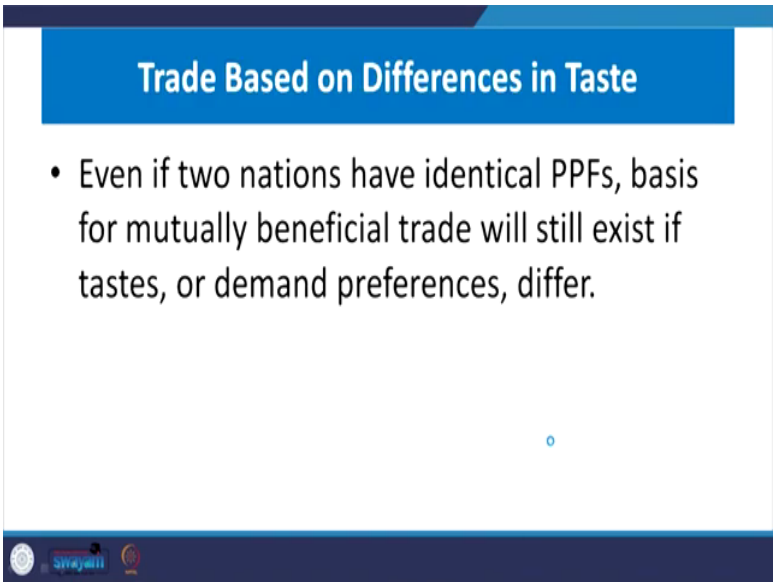

And these are you know I will discuss in detail in the next class where how prices are actually equalized.

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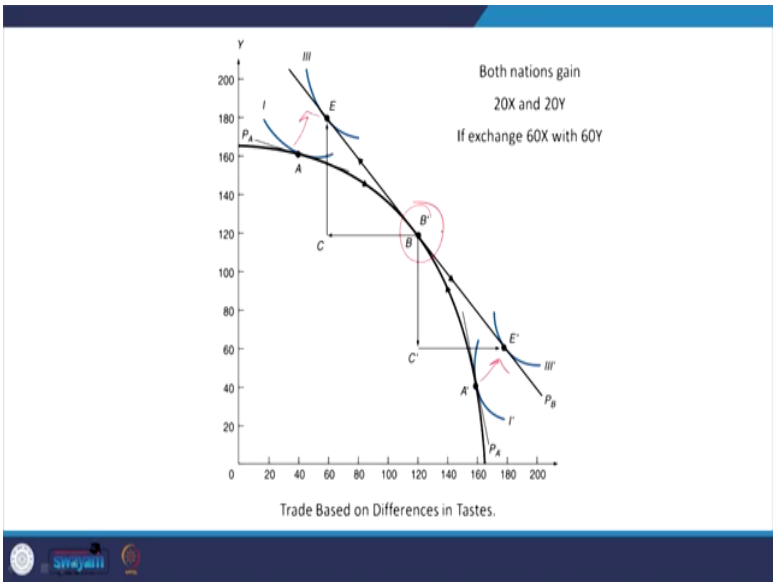

There are possibilities, price equalization theory will take off in you know Heckscher Ohlin model, there might be a possibility where the price ratio will be constant and will be similar in both the countries.

Now, so, the discussion once again for small country and large country for your clarity, that small country is end out with very less resources cannot able to you know produce all the demand raised by the large country. So, small country may specialize in one product you know, where is the large country has endowment of all the all the varieties. So, have the leverage in producing you know all the commodities.

So, the small country may not specialize in all, but large country can take both; because large country has exchange value as well as specialization value because large country has the resources more.

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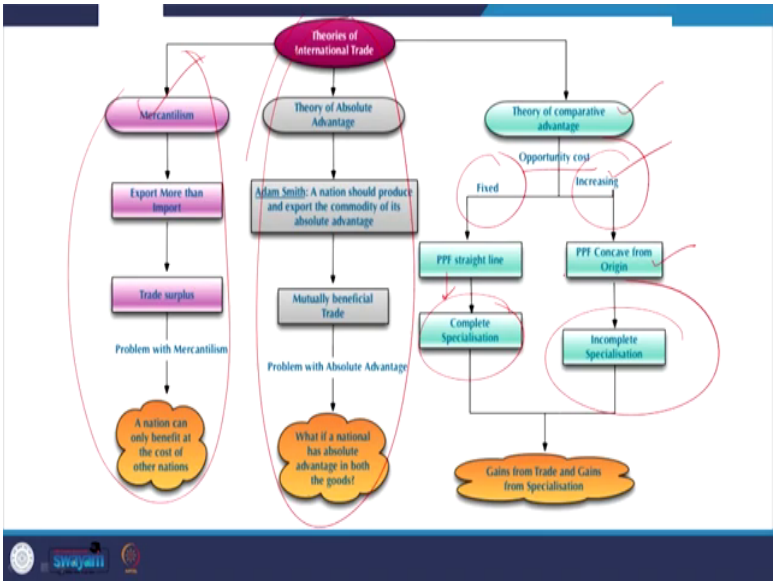

So, we have already discussed classical so far classical in detail. Then we are taking off the you know here also this is mercantilism we discussed this is classical in detail.

Now, we are taking off the opportunity I mean comparative cost advantage, but through opportunity cost principle increasing opportunity cost principle. Had it been a fixed you know opportunity costs PPF could have been straight line. And you know there will be complete specialization, maybe it is for similar small country nation or small country cases.

But in case in increasing opportunity cost, which we have already explained PPF will be concaved to the origin and there will be incomplete specialization and both country will gain. So, that is all for this particular you know session particular class. We will take it forward some of its discussion of the new classical framework to the Heckscher Ohlin model in the next class, with these let me stop here.

Thank you.