Strategic Trade and protectionism Theories and Empirics

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Lecture - 10
Empirical Testing of Comparative Advantage Theory

Welcome, once again to this course on trade we know Strategic Trade and Protectionism Theories and Empirics, we are on 10th lecture of this of this series, especially I am covering the you know 2nd week of our you know module. Where, we have been discussing classical theory of international trade and deriving the you know factors which were associated during the classical phase in explaining international trade. In this context we discussed couple of things, many examples, many you know facts which are very realistic one. We also compared with the advanced theories which relax many of the assumptions.

So, now you know you know to cover these we will take the help of many empirical testing which have been done and you may you know work out in your home. Now, myself Dr. Pratap C Mohanty is a faculty member in Humanities and Social Science Department IIT Roorkee. We will be happy to cover the very you know systematic aspects of understanding the classical strategies of international trade. Now, the title of this particular one therefore, meant is Empirical Testing of Comparative Advantage Theory.

So, let us start with our previous lecture where we left with number of couple of you know objective test, a objective you know examples, let us verify what you have understood so far.

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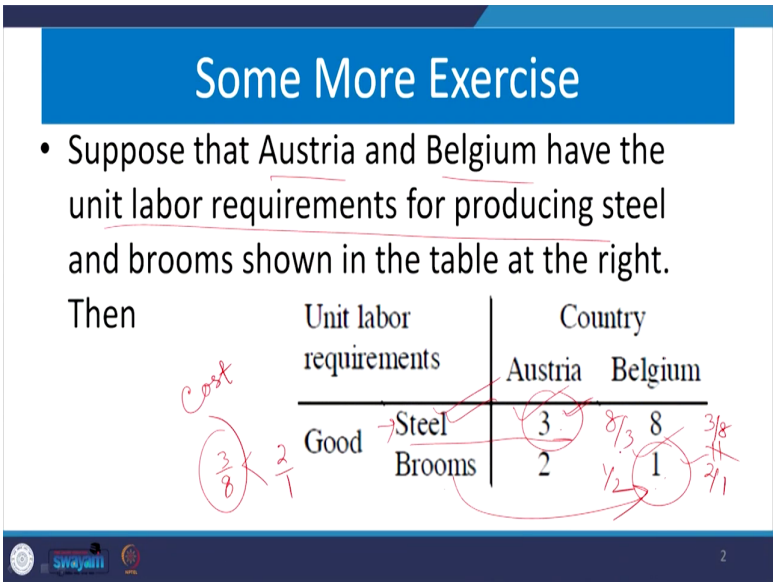

Now, start with the same which I have started in the previous lecture, comparing Austria and Belgium have their unit labor requirement. How much unit labor requirement they have introducing 1 unit of steel or 1 unit of brooms and here we are actually explaining cost of productions. So, this is clearly retain that unit labor requirement for producing steel and brooms shown in the table at the right.

Now, what we have we can define here now as I told you if it is a unit labor requirement so therefore, we have to minimize the cost. More we minimize more advantages the country derives while explaining specialization or even you know or exchanging goods with another community and other countries. Now look at so, since it is minimizing expenditure so, which product is actually less.

Across the 2 countries could be produced there less expenditure look at steel, steel produced with less expenditure in Austria as compared to Belgium whereas, brooms can be produced at a very cheaper cost half the cost and that of Austria. So, Belgium has absolute advantage in

brooms whereas, Austria has absolute advantage in the production of steel, so, unit production of steel. Now, that is fine and now simply we have compared the absolute figures and derive this. So, therefore, we will sell yes there will be trade and it will be beneficial for both the countries.

Now, what will happen if you the same example we will take it forward for the understanding of comparative cost advantage, we have to take the ratio of cost functions. Now what happens take the ratio I mean relative cost of production of the same commodity. So, it is 3 upon 8 so, this is 2 upon 1. Now 3 upon 8 and 2 upon 1 now these are not equal for sure these two are not equal. So, since I mean relatively they are different there is another window of internal trade due to comparative of advantage as well, now these are the preliminary understanding before going to check your objective 1.

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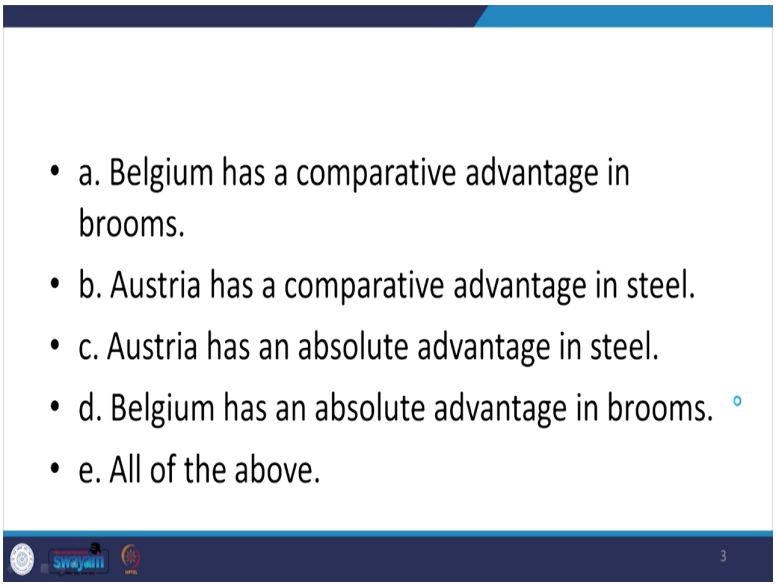

Now, look at Belgium has a comparative out of these five choices which will be the right option. Belgium has a comparative advantage in brooms, let us check Belgium has a comparative advantage in broom. Now, we have talked about a comparative advantage we need to understand it. So, first of all come to the absolute one, Austria is an absolute advantage in steel is it right Austria has an absolute advantage in steel as for the absolute cost advantage it is right correct.

Now, Belgium has the absolute advantage in broom, Belgium has an absolute advantage in broom that is also correct. So, both of the options are actually correct. Now, come to the you know other options, look at the comparative advantage and let us interpret fast. Now, 3 upon 8 3 by 8: that means, relative cost of production steel is come to relative cost of production of brooms in Austria.

So, relative cost of production this one is much cheaper as compared to 2 upon one. So, relative cost of production of Austria for steel is much cheaper whereas, for broom Austria double expensive as compared to Belgium, but this is I mean half the cost even less than half the cost of production I mean for steel specially in Australia, Austria this is less than half the cost of production than that of Belgium. So, therefore comparatively we can infer to the fact that Austria has completed advantage of steel production over broom. So, let us check that so, Belgium has competitive advantage in brooms, now we said Austria has comparative advantage in steel.

Now, similarly the reverse Belgium I mean Belgium has comparative advantage in broom. If you take the reverse ratio like 1upon 8 by 8 upon 3; so, 1 upon is half the cost it is double more than double if I just take by take the different ratio 8 upon 3 and 1 upon 2, I mean Belgium has half the cost in that of the production of Austria so far as brooms are concerned. And similarly, for steel Belgium has double more than double the expenditure for production of steel as compared to Austria.

So, therefore, comparatively Belgium is better in broom and Austria is better in steel. So, let us see Belgium has comparative advantage in broom this is correct, Austria is comparative

advantage is steel. These two we have already verified these all are correct so, therefore, all of the above is right.

So, this is the right answer ok, I hope it is you know connected very correctly and any kind of changes like these in the questions you know even if the example itself is easy is absolute based on absolute cost advantage. But, we can I mean differ with the you know explanation to understand to the fact that it has also interpretation for comparative advantage cost advantage theory. So, I hope this is clear, let me proceed to the next example yeah.

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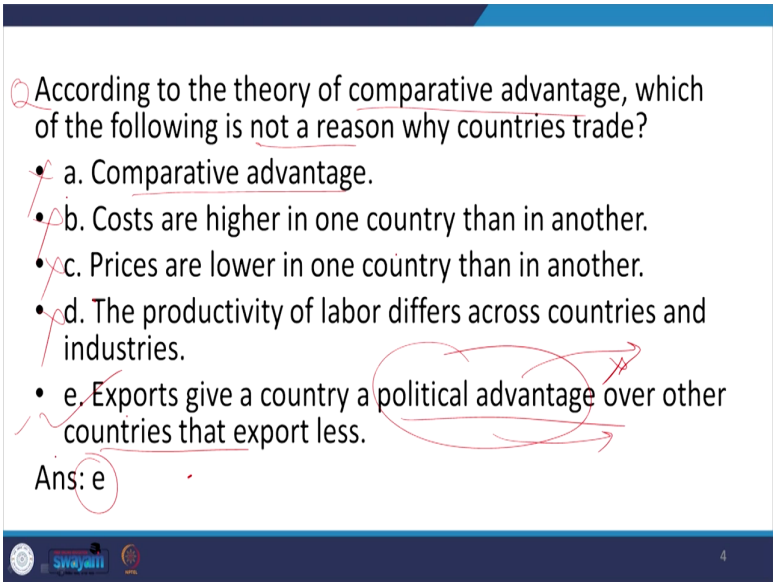

Now, according to another question is here, now according to the theory of comparative advantage which of the following is not a reason why countries trade? Which is not a reason why as for the comparative advantage which is not a reason why countries actually trade? Now, reasons are if there are comparative advantages then country will certainly trade so, this

is not an answer for sure. Cost are higher in one country than another so, cost wise trade actually takes place so, this is a reason.

Now, here we are asking which is not a reason this is not the answer this is of course, the reason B is also a reason, but they are saying which is not a reason. Prices are lower in one country these also I mean is a reason, but so, say as per the question this is also not correct. The productivity of the labor differs across countries and accordingly we will specialize so, this is also a reason, but since we are seeing not a reason.

So, this is not an option exports give a country a political advantage over other countries. So, political wise no such discussion have yet we mentioned in classical approach special in comparative cost advantage, and there are to political advantage and its connection with productivity or with you know cost differences age is not that linearly understood or not that easily understood.

And, there are might be number of interpretation political advantage might be good for cost or no might not be good for cost cutting. So, we cannot actually expect what are the interpretation so, therefore, this is not a reason. So, this is the answer for this question. So, e is the answer all right and very quickly you can you know define the answer based on our previous or existing understanding.

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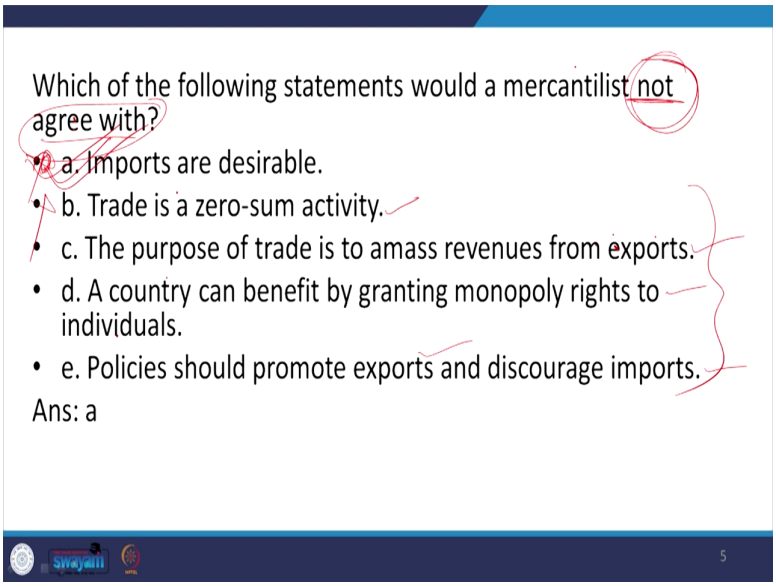

So, move to the next question which of the following statements would a mercantilist not agree with. So, we are now explaining some of the you know sample questions, we will immediately go to the other calculations for international trade statistics, for you know understanding classical theories empirically. Would a mercantilist not agree with, mercantilist if you remember they believe in zero sum trade, they believe in exports more I mean the borders are closed there are various you know explanations to it.

So, they said imports are desirable, now look it carefully not agree with. They said exports are desirable so, this is not an answer. So, then never said imports are desirable trade is a zero sum activity. Now which are the following statement would a mercantilist not agree with this is that they do not agree with because imports are they said exports are desirable imports are not desirable in mercantilist. So, this is they do not agree so, this is the answer actually. Why?

Because we say not agree with they do not agree with the fact that imports are desirable. Now, this is what they agree with zero sum activity.

So, this cannot be an answer, because we are saying not agree with. The purpose of trade is to amass revenues from exports exposed the agree so, this is this is as per they agree. So, I mean as per the postulations of mercantilist theory a country can benefit by granting monopoly rights to individuals, that is you know they agree with.

Policies should promote expose discuss input they agree with so, these are agree with. So, here we are asking not agreeing so, imports are desirable which is they did not agree so, that therefore a is the right answer ok. So, mark carefully initially I thought it is you know agree with. But actually the question asked for which where they did not agree with. So, therefore, a is the answer a is the answer here.

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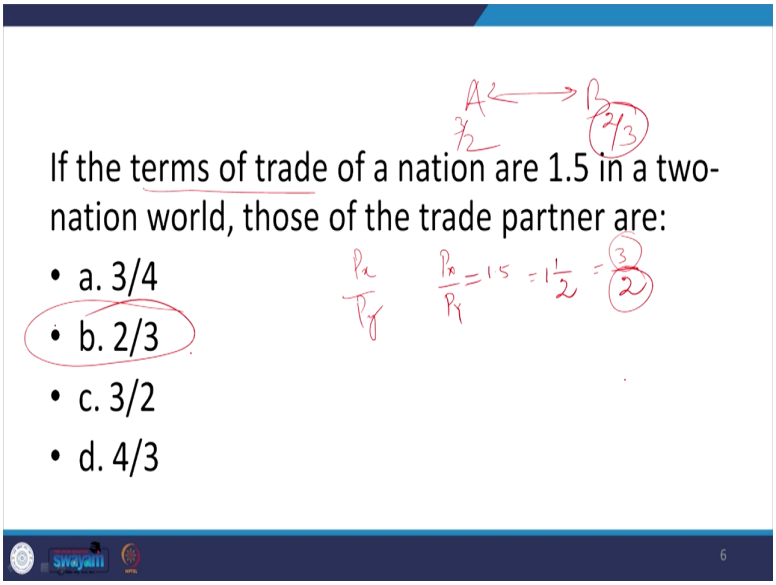

Now, let us move to some understanding of terms of trade, terms of trade we discussed while explaining you know P x by P y, x and y stands for exports and imports. If the terms of trade of a nation are 1.5 P x by P y equal to 1.5, which means; you know which means 1 upon 2, which is equal to 3 by 2 alright. So, the relative price of exports is higher than that of the relative price of imports. So, it is 3 as against 2, exports are higher as compared to the imports they do.

And so, what happens if the terms of trade of A nation are 1.5 in 2 nation world there are only 2 nation, nation A and nation B here where we are saying it is 3 by 2. So, what happens? So, if the relative price here it is 2 for imports and it is 3 for exports. So, what those of the trade partners and its will be 2 by 3 for sure, because it will be simply reversed since it there are only 2 countries the relative price will be just reverse. So, let us check it is here 2 by 3 so, the answer is b.

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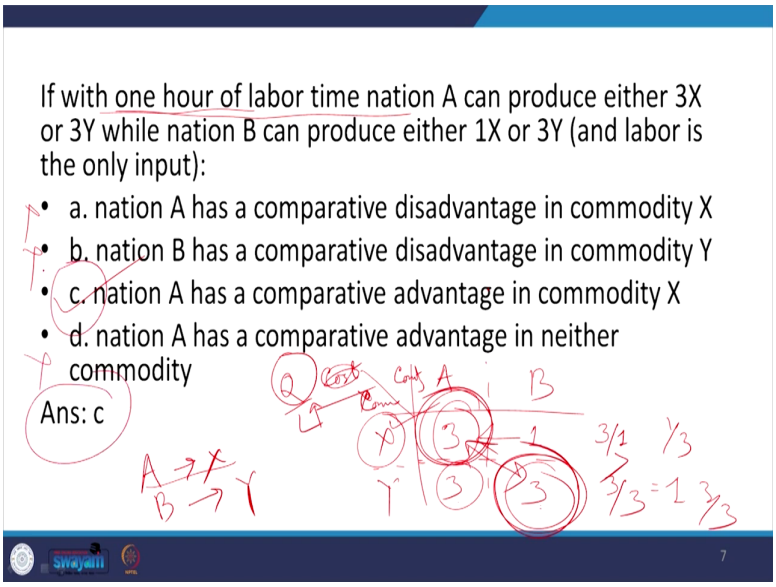

Now, let us move to next example which is bit I know complicated by you know the notations if you read between lines, now things are very clear to understand. If with 1 hour of labor time and nation a can produce 3 X. Now, you have to plot it very clearly, make it like this and make it a further break here to identify the individual country A and B. Now, country A we have same country B, country A can produce here what is your unit labor requirements, so, unit labor requirement.

So, these are X these are country I mean these are commodities, these are countries, country this is commodities. Now, this is unit labor basically what trying to define the cost. So, A can nation A can produce either 3 X or 3 Y, nation A can produce 3 X. So, this is let me X and this let it be Y, nation A produce 3 X and 3 Y, while nation B produce 1 X and 3 Y with the and the labor is the only input.

So, with 1 labor ok, now the question here is with 1 labor or they can produce this. So, this was this is not cost these are productivity Q by L. So, per unit labor how much quantity the produce it is presented here. Now given this how can derive the answer, now simply try to look at X and Y there are 2 communities produced and these are the productivity. Now, for X country A at maximum can produce 3 units as against country b.

So, in absolute sense country A has huge advantage, where is country Y they are same. So, here as well as here I mean for communities Y both the countries has you know equal advantage. So, now, there are 3 options so, through absolute cost advantage we cannot able to define in a answer whereas, through comparative cost advantage simply take the terms of trade 3 by 1 unit cost of production of X in country A and unit cost of production of Y that is 3 by 3.

So, unit cost of production is greater than, then that of production of Y in country A. So, country A is 3 times higher in producing the product of X. So, country A is much specialize in producing these since you are discussing productivity here whereas, country B it is the ratio 1 only, I mean here the country A and B are indifferent, but for sure country a has huge advantage in producing this.

So, comparatively country A has comparative advantage in production of X that is for sure. Now, in reverse what you do 1 upon 3 and 3 by 3. So, country B is very expensive I mean very less productive to produce commodity X. So, certainly for international trade country B should choose to produce commodity Y. So, there are should be mutual possible trade so, country A should produce X comparatively country B should produce Y you know comparatively.

So, there will be possibility of comparative advantage so, now let us check what is the answer. So, nation A has competitive advantage a cover disadvantage in commodity X, nation A has disadvantage know this is not an answer. Nation B has comparative disadvantage in Y this is also not answer, nation A has comparative advantage in commodity X right this is

correct, nation A has a comparative advantage in neither of the products is wrong. So, therefore, c is the answer alright. So, we must proceed further to understand all the details.

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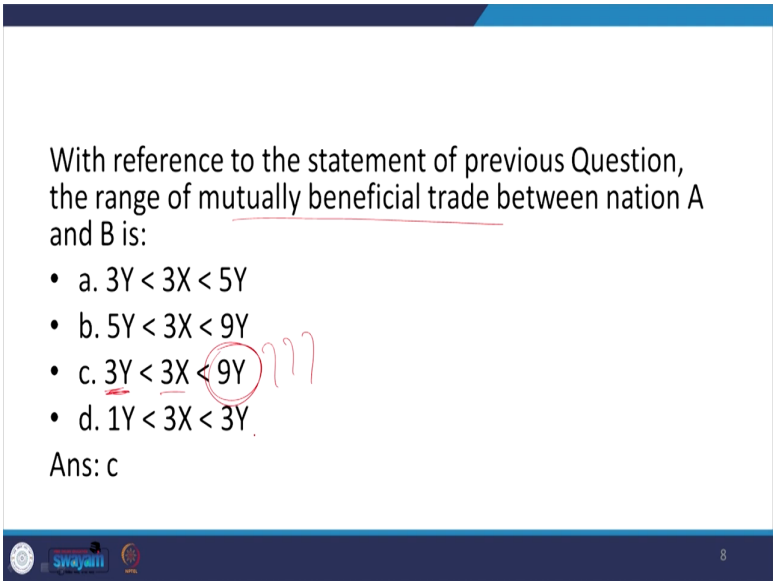

Now, given these questions mutual beneficial trade if I try to you know derive mutual beneficial trade between nation A and B. Now, you go and check we have already explained in earlier context, now in both the cases nation A has higher productivity as compared to as compared to you know other country. So, nation A has leverage in producing both the commodities so, nation A we will start with its bargaining.

So, minimum of 3 Y is required for 3 X to export ok. So, I will I have given you the hint to think about, now 3 Y is required answer is c here so, 3 X you can imagine why 9. So, think about it and try to define it, and if you do not do it we may carry forward this for further discussion in the doubt class.

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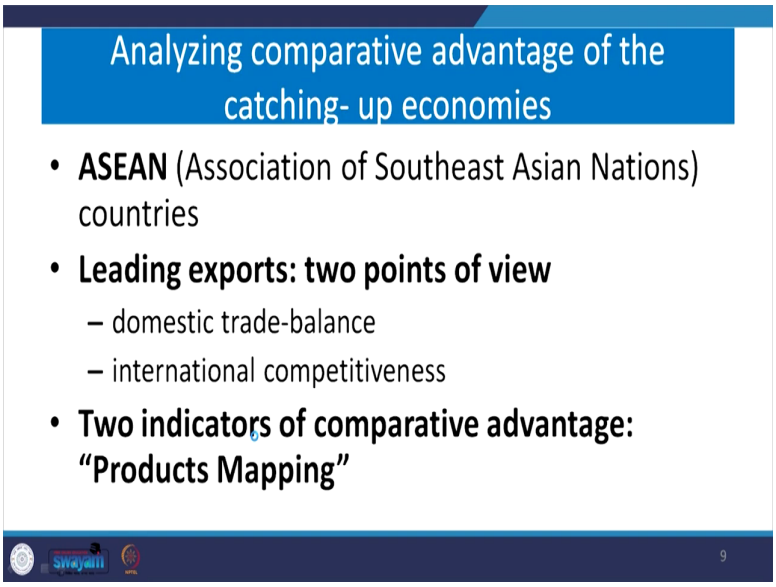

So, let us move on to the realistic example from different literature and since you know some of you might, prepare for you know research in a long run you know may go for PhD those who are doing PhD, you may also deep down further. Now, let us say you know check a catching up model and its some of the instrument used to understand the model.

So, we have cited here as an economy association of southeast is in nations which have actually grown know in the for over you know 30 years, till especially saw you know southeast Asian countries, east Asian miracle we know it east Asian crisis also we know it we discussed earlier. So, therefore, our concern here to understand you know what kind of comparative advantage they had in those periods so, many experts analyze.

So, there are two you know points of view to explain the Aegean comparative advantage. So, domestic trade balance perspective and international competitiveness perspective, so, in these two fronts let us understand the products mapping and tap the comparative advantage.

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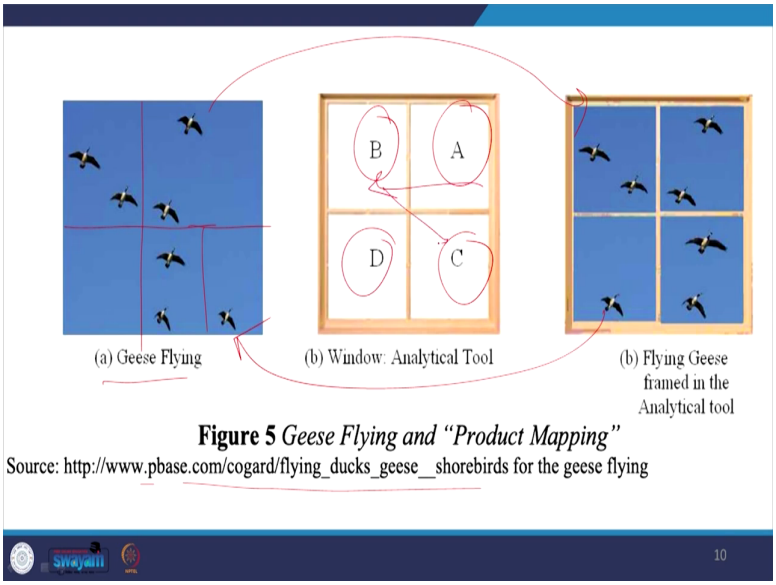

Now, it is proposed by this you know or a probably it here you can check this site for further details that the source. Now, an imagination how are presented in a systematic theory are explained how here or to talk about the comparative advantage and Ricardian framework. So, we could see in picture a geese are flying in different shape as if an exports and import you know you know baskets are flowing, to different countries.

We simply you know plotted in different setups like this and we can break it like this and categorize it this is nothing, but here we put it here as here. And we for a systematic presentation we name it as A B here then C here D here then here we compare then to here

alright. So, the analytical window here will take the help of their instrument discussed and explain things.

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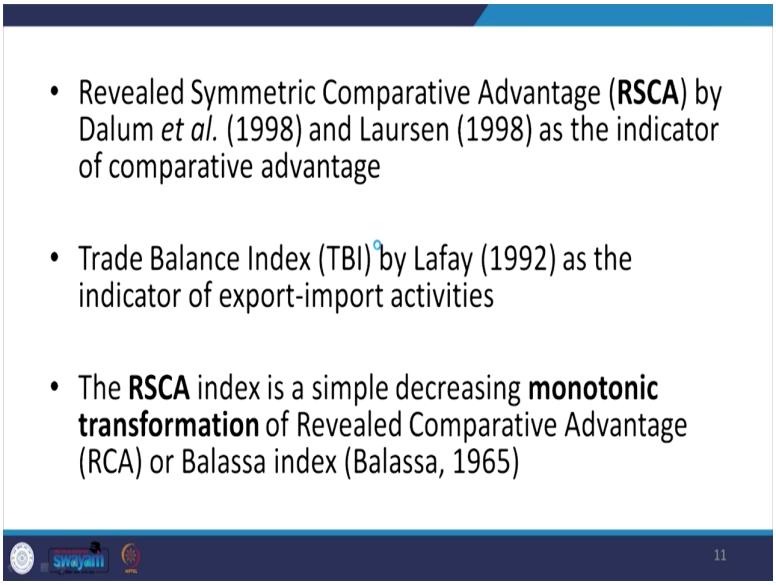

You know it is systematically possible so, there are basically two approaches applied by the you know author. So, they said instead of revealed comparative advantage which we try to discuss, but incomplete it we will discuss today in another 5-6 minutes in detail. So, we will comparative advantage I mean not just enough to explain they said its one must be systematically presented, by develop by Dalum et al 1999 paper and Laursen 1998 paper is the indicator of comparative advantage.

Trade balance index were actually developed by Lafay in 1992 paper as the indicator of export input activities and their direction of trade. Basically, RSCA which we are trying to

say revealed systematic comparative advantage, simply a monotonic transformation of the RCA revealed comparative advantage it developed by Balassa 1965 paper.

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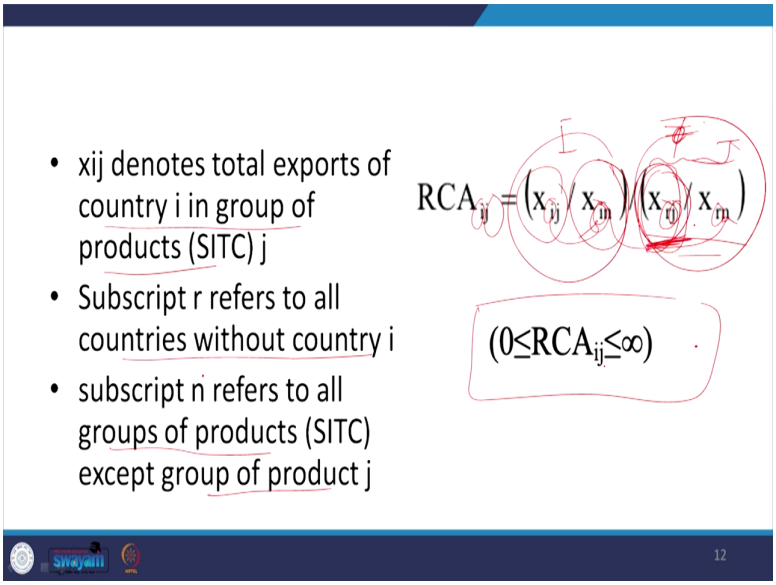

So, what do you mean by revealed comparative advantage we have already discussed, I said it is simply a ratio numerator to denominator. Numerator stands for the country specific country and denominators stands for the country other than other country or the world as a whole.

So, now xi denotes the total exports of country i in group of products; group of products the out of the total products, group of products j and i stands for the country specific country i and j. Subscript r refers to r here, subscript, subscript r particularly refers to you can refers to all countries without country i so, we are here discussing other than the country.

Now, x i stands for the particular country substitute n refers to r here the other countries n here is written n stands for refers to all groups of products, n stands for all groups of products except group of products j ok. So, what happens this is basically country i this is basically country i, for a particular product j out of total exports of that particular country for a particular industry, out of the total exports other than that particular product in the particular country i.

So, i is here so, basically this is country i the other than i not i other than i rather we are discussing here at j this is basically j ok. And, here we are sticking to the product called i only that is yth industry where it is other than ith industry, so world as a whole export and is ratio domestic country in whole and its a ratio. Now, ratio of domestic exports out of this total export other than that particular one out divided by the world exports from that particular product out of the world export, of that particular industry j out of the total exports. So, comparatively how things are you know discussed, we need to think about very systematically as possible. Now what is RCA then? RCA basically finds a clear comparison of all those things.

So, the raised if you try to you know define it will be varying from I have already discussed in the earlier lecture varies from 0 to infinity, because it might be 0 starting with zero exports of the ith industry so, 0 is possible. It might be the case that you know 0 or in the other you know you know other country and then the ith country that might be possible to 0 here in the denominator. So, 0 is a possibility here so, therefore, something divided by 0 is infinity.

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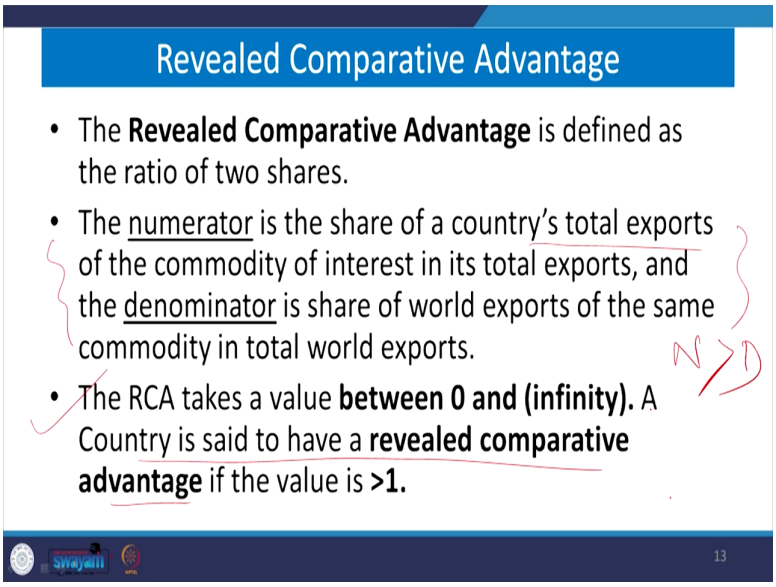

Now, so this is what I have explained here. So, numerator is the share of I have already discussed this go through this carefully, you can able to understand in detail. Now, one thing to be noted RCA takes a value 0 and infinity I have said. So, country A is said to have a revealed comparative advantage if and only if the numerator is greater than that of the denominator; that means, the ith country has higher value of exports as relatively as compared to the international other country.

So, therefore, it is certainly a revealed one, not just comparative advantage on its own so, we have compared in a very revealed friction. But, we will emphasize you know differently you know in my next slide, but try to you know understand the fact that so, advantage and disadvantage can be understood from this index.

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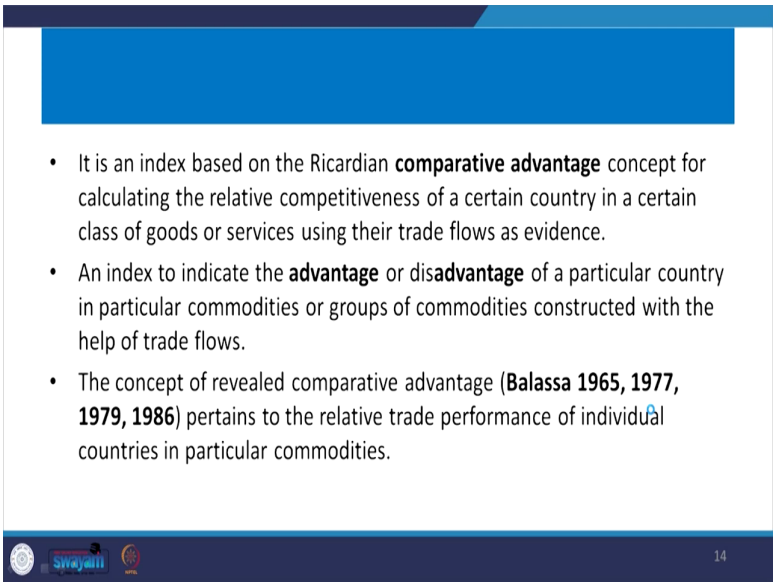

So, Balassa has different paper actually you know captures different examples.

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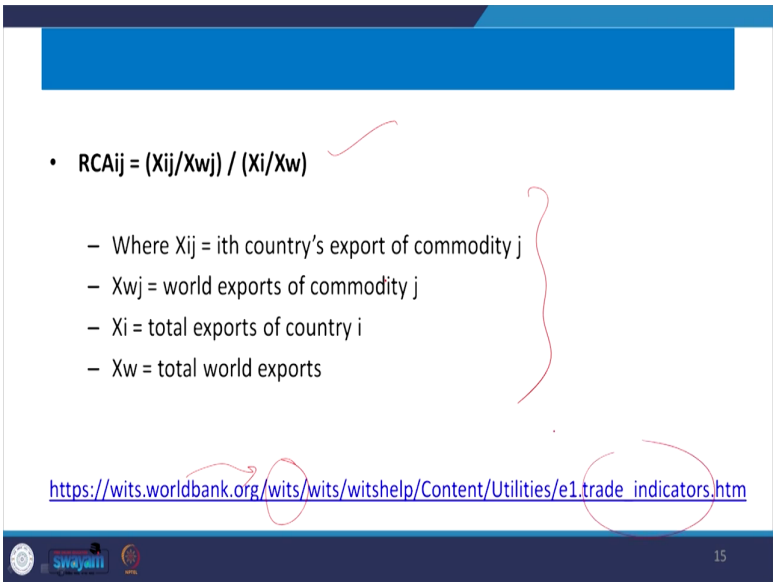

But no, but now we are now interested in explaining for the particular country as you know particular group of countries that is Asian countries ok. Thailand, Hong Kong, China, you know Singapore, Vietnam those countries are being explained right now. You know to get further ideas of for different indices in measurement wits world intellectual trade solution which I discussed earlier; it is the portal of world bank contains so, many variety of indexes, indices to explain trade, or trade indicators are mentioned. So, if you have interest you can go through and verify it with this link.

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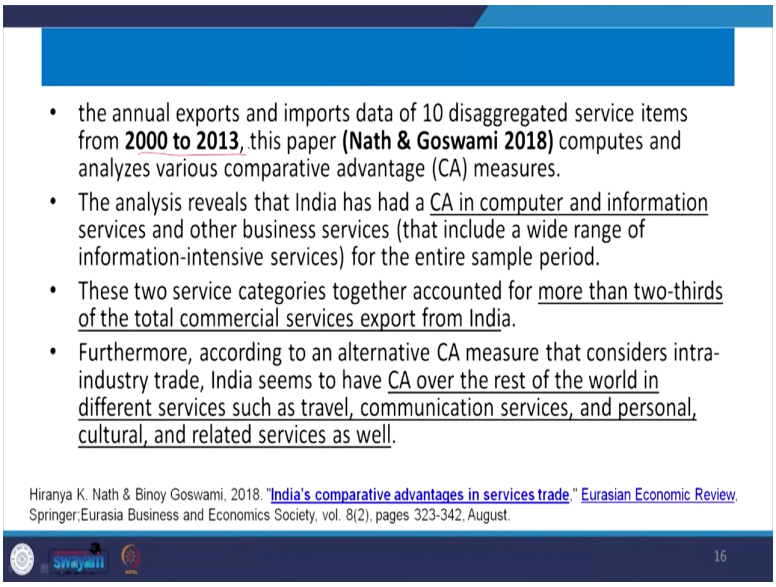

Similarly, annual exports and imports data obtained disaggregate services items from 20 2013 to 2000, 2000 to 2013, were explained in this paper by Nath and Goswami especially for Indian context. And, they computed that you know India is comparative advantage for computed and information you know services are much better, you know we have you know advantage more than two-third of the total commercial services exports are from India only in their paper it was observed.

So, the comparative advantage over the rest of the world in different services such as travel, communication, personal, cultural related services as well are better in India as compared to other countries. So, this is highlighted by Nath and Goswami paper you can go through this link to find out and publish in Eurasian Economic Review paper.

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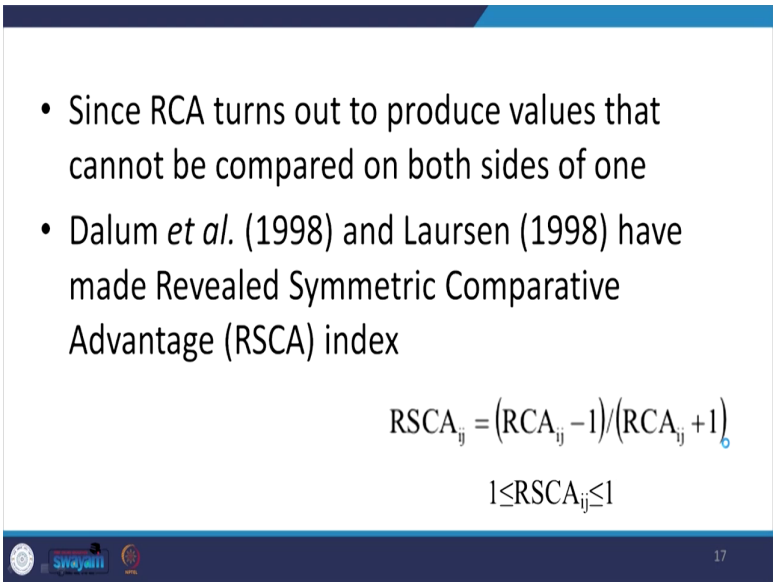

So, RSA which we have said only talks about certain limited direction. If you just have a monotonic transformation just by, you know taking a minus in ones side I mean basically you know negative monotonic transformation which have said RSA turns out to be you know turns out to produce values that cannot be compared on both side of one.

Both side of one basically we said if it is less than 1 then what happened if it is greater than 1 and then what happens it is very difficult to define. So, therefore, we need to take the help of other indicator called you know reveal systematic comparative advantage. Now, if you were this minus 1 to you know plus 1 if you add it will have a range go and verify it will be range from 1 to 1; so, minus 1 to 1 where we can able to define it.

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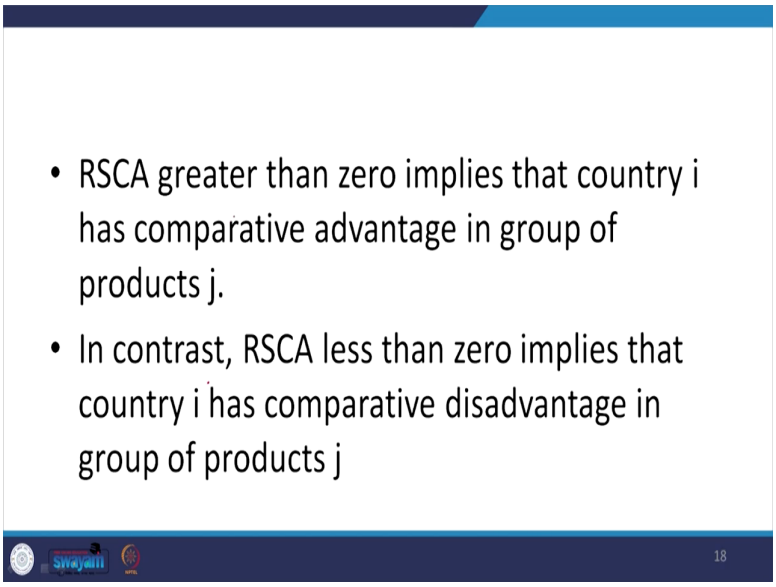

So how is it so? If r is greater than 0, I mean the standpoint we are now keeping it if it is greater than 0 it should be minus 1 to 1. So, here this is minus is missing please correct it. So, if it is you know greater than 1 which implies simply what it says that country i we are sticking to his comparative advantage in group of products j ok, but which was not discussed simply compared in the RCS model. If it is less than zero; that means, it is you know comparative disadvantage in the group of product j.

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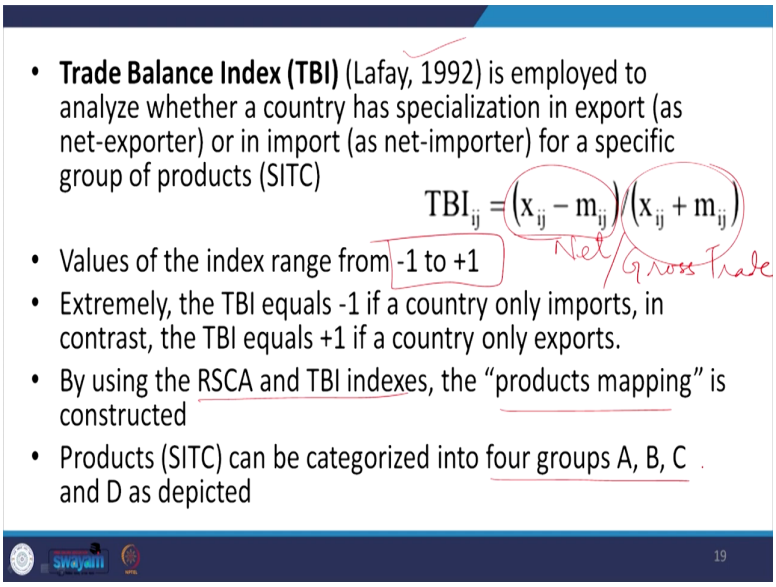

So, this is very very important, now to check it carefully we are supposed to discuss with the reveal systematic comparative advantage you know approach. Similarly, the trade balance index TBI is Lafay is you know presented this in a paper 1992 which actually just takes a you know largely we can say normalization. Through you know I mean outer total basket it is basically the total trade minus the net rate basically net rate to total trade gross trade.

So, we can find out net importer or net exporter it takes the value if you check it very carefully you can easily understand it takes the value from again minus 1 to 1. So, now, both of the index if they are taken together product mapping is possible by using both the indexes because its ranges are also from minus 1 to 1. So, those by including 2 together 2 index indices together we can put it into four groups that is A, B, C, D and presented here.

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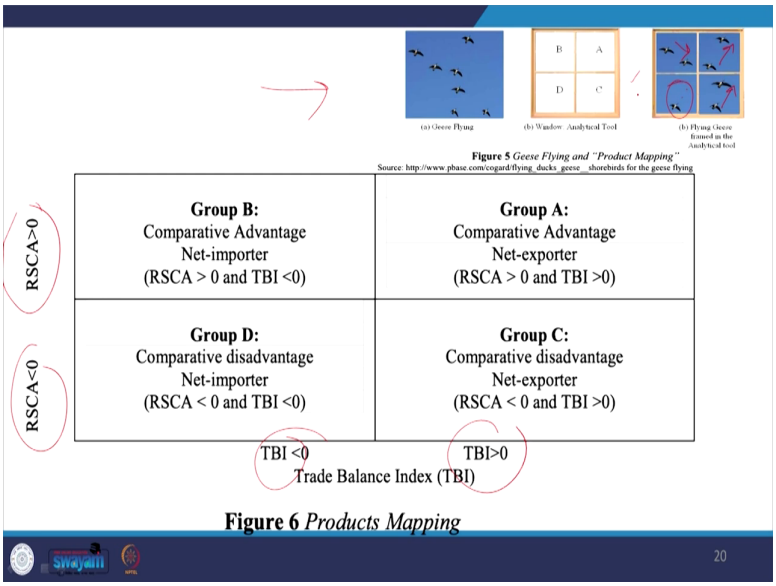

The same example an imagination made by that author, from where we put it into four you know boxes. Now, we are saying look at these first look at this and then these and this. Now, it seems as if we are here as if we are net exporters ok, and here also we are net exporter so, far as the you know the index is concerned this index TBI; a TBI index trade balance index by Laplace concerned.

Now, I mean from the picture itself it seems its here, it seems as if we are net importers because there is no such you know clear additions here, so there are possibility of imports. Now, alternatively if you check the systematic we know comparative approach we can find out for comparative advantage and disadvantage. Look at if the value here you look at this very clearly, the gap really matters now this is comparative if the value exceeded 0.

So, it seems as if you know we have comparative advantage whereas, look at the magnitude and the differences exports is its expected to be exiting and the rate of change is exiting, actually the distance is exiting. Here the change is by horizontal very less. And so, therefore, this side expected to be greater than 0 and 0 accordingly we said comparative advantage so, this is positive comparative advantage here and this is negative. So, and we can define it by comparing these things together and go and check if you have confusion will we make carry forward in our doubt class.

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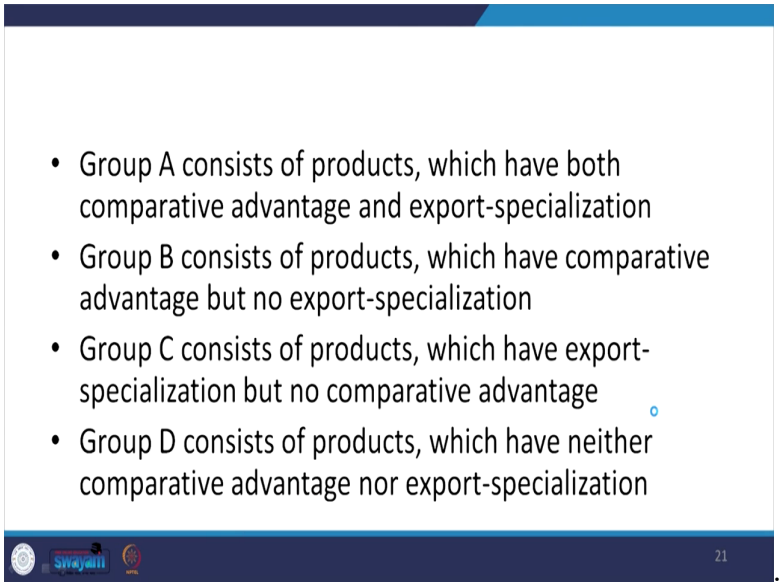

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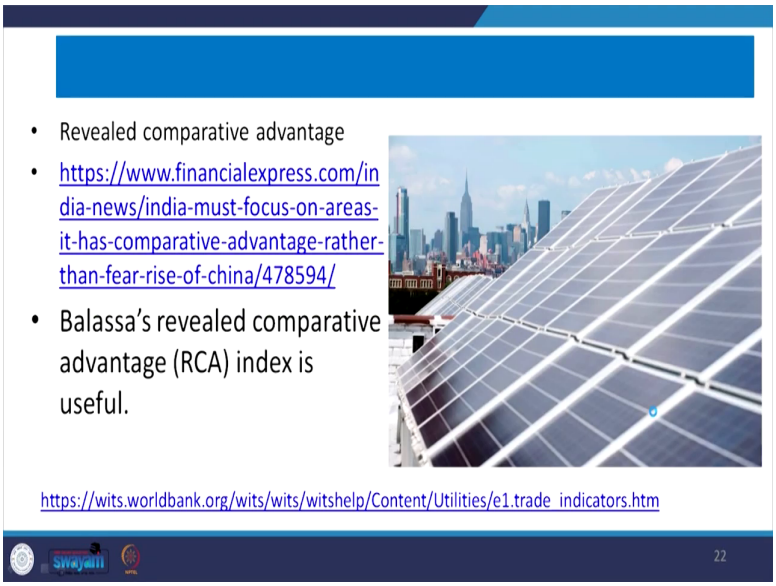

So, this is what I have said say accordingly the country actually specialize. So, in the last 1 minute discussion I will talk about you know examples we have already made I will discuss.

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So, last slide for the discussion of this particular lecture on India and China, we have repeatedly said that China has advantages in manufacturing, where India has many other advantages. So, the bottom line here is the India should not be worried, there are many newspaper articles and based on those indices we are confirming to the fact that we must wait and watch and tap the benefits and lead with our details.

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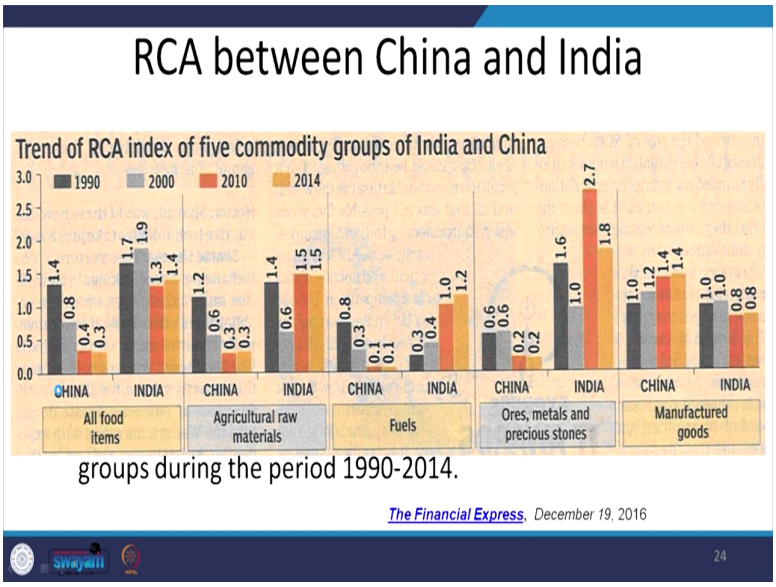

Now, these are the figures where India and China details are given, you can find out for all items differently. And, try to understand how India has huge leverage in these contexts. With this let me thank you and you may prepare accordingly and carry forward in the next class.

Thank you.