Strategic Trade and protectionism Theories and Empirics

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Lecture – 24
Measurement of Terms of Trade

Welcome dear friends to the we knows NPTEL module on Strategic Trade and protectionism Theories and Empirics. We are now at the 24th lecture on the understanding of Measurement of Terms of Trade. Though we have already started this topic in this particular week, where we have been emphasizing various concepts of terms of trade and its connection with you know developmental indicators.

So, therefore, you know in order to go into the depth of terms of trade and its understanding to the international trade strategies, we are supposed to also you know imbibe our self with the you know detail measurement of terms of trade. So, therefore, the title of this 24th lecture is specified with measurement related issues.

So, title of the presentation is, title of the topic of today's lecture is Measurement of Terms of Trade. Myself Dr. Pratap Mohanty, faculty member Department of Humanities and Social Science.

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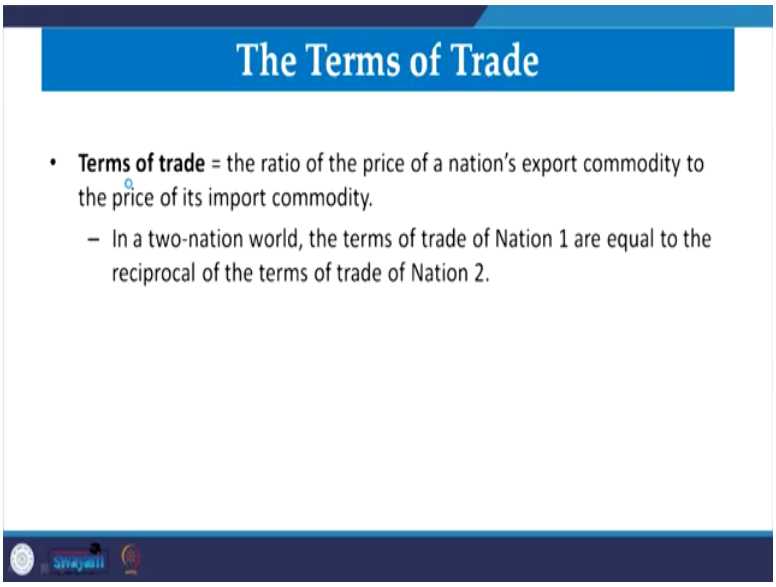

So, we have already discussed this part what is called terms of trade. As we understand the terms of trade is nothing but an index a ratio of index of export prices to import prices. And largely you know understood in terms of it is you know payment towards export prices to import prices of the commodities.

Now, why was again confused because of whether it is the volume of trade and its export prices or import prices really matter or the you know; or the you know price or the you know factors those are involved within the trade transaction are important or we may also think of the welfare changes or the quality of the product. There are various way of understanding terms of trade. So, therefore, this lecture is on clarifying this.

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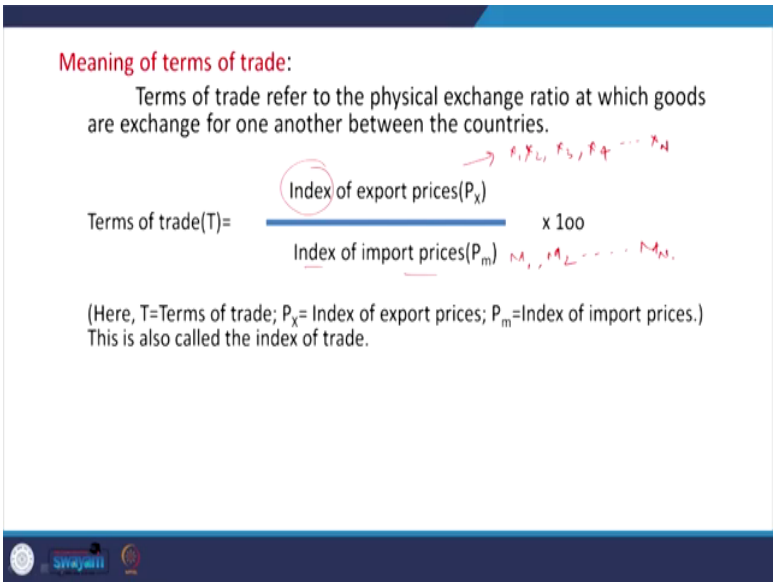

Starting with the meaning of terms of trade again, the simple calculation of TOT the terms of trade is on, index of export prices to index of import price. So, index is very important because a country usually is attach with various products. X 1, X 2; X 1, X 2, X 3, X 4, till N number of; N number of products. Those are exported.

Similarly M 1, M 2, M 3, M N products are attached. So, therefore, an index of their prices or the average prices with weighted average or not, we will think about in our measurement issues. So, those are very important to calculate the terms of trade.

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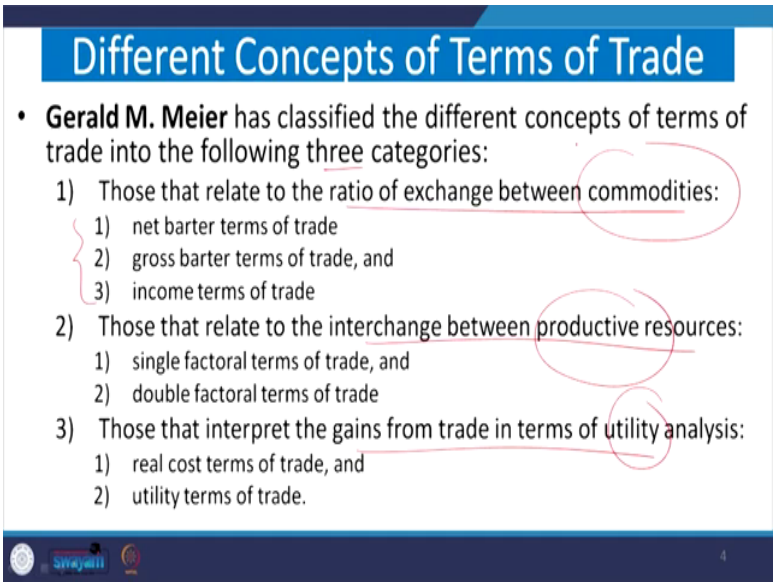

So, what are the different concepts of terms of trade then? Initially, you know Gerald Meier is classified different concept of terms of trade as for the following categories. They defined especially Meier and we also attach another many person's contributions to these field, now initially they talk about ratio of exchange between commodities.

So, broadly the measurements are actually defined into you know 3 categories. First of all as I just mentioned you know the first categories purely based on the commodity exchange and commodity exchanges are again of 3 types, net barter, gross barter and income terms of trade, where somewhere we are attaching to the commodities. Commodities and exchange to define the terms of trade.

Second set of argument in measuring terms of trade as suggested by Meier is due to the interchange between productive resources and basically that the second set of you know

instruments which are developed by the by Meier is on interchanging productive resources. What do you mean by then productive resources is related to whether the factors those are involved are productive or they are not productive.

Now, whether one factor that is productive or both are productive. Now, in this context probably it is you know good to emphasize productive factors by relating to you know there are many calculation made by total factor productivity by many you know experts in the world. So, TFP, total factor productivity is one of the most important indicators of measurement of productive resources.

Third set of argument or the categories defined to measure a terms of trade is through the gains from trade in terms of utility, the focus here is utility derived from the trade from export or import. The second one was on productive resources. First one is in simply commodity of exchange of commodities.

Now, what a infer out of it? On the last component, the third component again it is of two types real cost terms of trade and utility terms of trade. Now, what is the real cost of you know exchanging the goods and commodities? Must be understood in the trade context.

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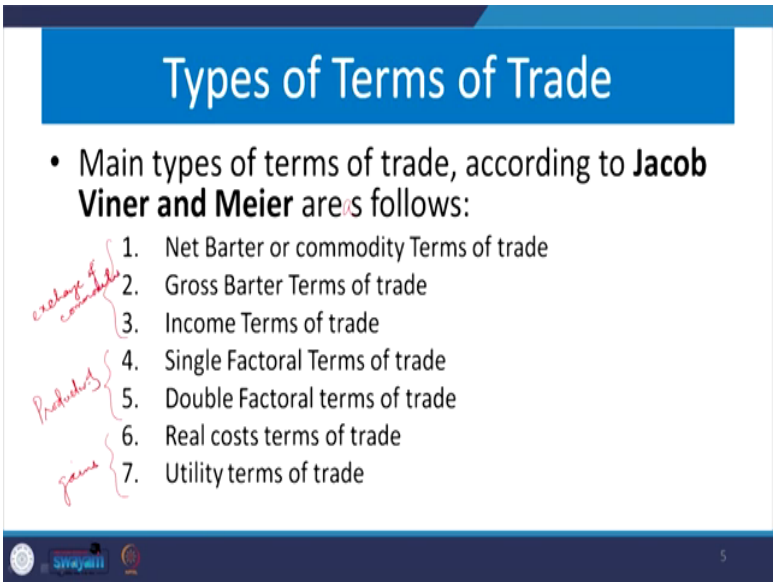

Now, let us talk about one by one. So, Jacob Viner and Meier actually structured into as this is as followed as. And they are structured into those categories for the Jacob Viner and Meier, Gerald Meier as I mentioned in the previous slide, where first category is on net barter commodity terms of trade. And the second categories of gross barter terms of trade. And the third one is on income terms of trade. Fourth one, I mean again these are of all these 3 category.

First category is single factoral, then double factoral terms of trade, sixth this is of second category which we discussed. Third one is of real cost terms of trade and utility terms of trade. This is based on you know gains. This is based on productivity. This is based on commodity exchange, exchange of commodities.

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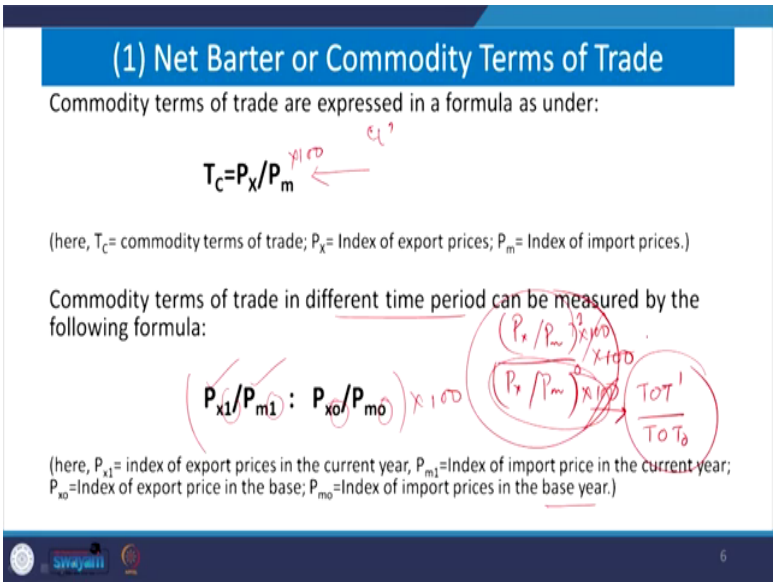

Now, so the term types of trade is actually conceptualized accordingly. Let us understand and unfold the discussion to categorically emphasize each of the instrument just mentioned. First one, as I just said not net barter terms or commodity terms of trade is nothing but the index of export prices to index of import prices. Now, you know a commodity terms of trade in different you know time period can be also measured by falling formula.

I mean as if you simply refer to a specific time T then this is fine, but now, if you have different time period to compare, compare our terms of trade then I mean 100 is assumed everywhere, everywhere 100 is assumed. Here also we can assume with multiplying with 100. See if a different time period, then how should we go for it? If it is a different time period then certainly you know the base period must have been emphasized. Base year, what is the base year? What is the comparison of base year? Must have an emphasis.

Now, here we are referring price of export of you know of current year and price of imports of the current year. 1 stands for the current year, whereas 0 stands for the base year, base year is mentioned. Now, it is all about P x by P n in period 1 divided by P x by P m in period 0 or base year into 100. So, for comparison purpose, we are supposed to take the ratio of prices that you know the terms of trade TOT of period 1, TOT of period 0.

So, it is basically comparing, it is basically comparing the time period, the rate of change or terms of trade between two time periods. So, that is another way or here if we just you know multiply 100 here, then 100 here, 100 100 cancel actually. So, this simply ratio will give you the result, right result, so far as different time periods and commodity terms of traders are concerned.

And here net is considered because we are considering the net in terms of the prices. Now, what about gross then? We will actually talk about in the next slides, now let us understand what is the problem with the net barter terms of trade.

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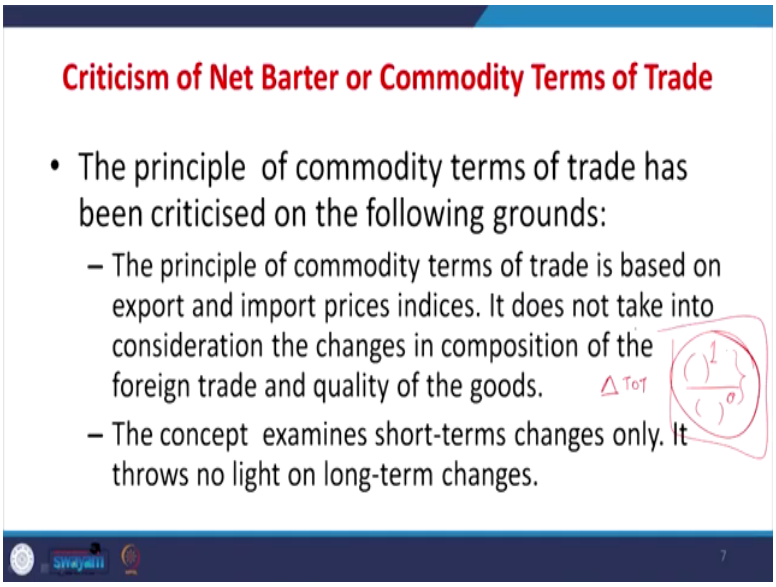

Now, as pointed out by experts that the principle of commodity terms of trade has been criticized due to many many you know grounds, some of the important grounds. Now, the first ground is due to the fact that the changes in the composition of foreign trade and their quality of the goods has not been you know they have not been considered. Terms of trade is only based on export and import prices whereas the you know composition of trade basket, and the quality of their goods I have not been considered truly.

And the second aspect, second criticism of the net barter terms of trade is due to the time factor, and the concept this concept only examines short term changes, whereas it does not talk about the you know long term changes. So, two time period, suppose we are only concerned with period 1 divided by period 2, period 2 or period 0, if these are of I mean time

distance is not far away or not far then the you know the change is the delta of TOT is actually captured properly.

If the base period is far away or far from the year of current year then the change this way of change or identify the change is actually not correct. Because you know we are the in between if the years of you know change a is too large then you know the impact in the trade basket would have been very different and this method is not capturing this correctly. So, that is one of the; one of the pitfalls of net barter terms of trade. Now, let us examine another aspect you know gross barter terms of trade.

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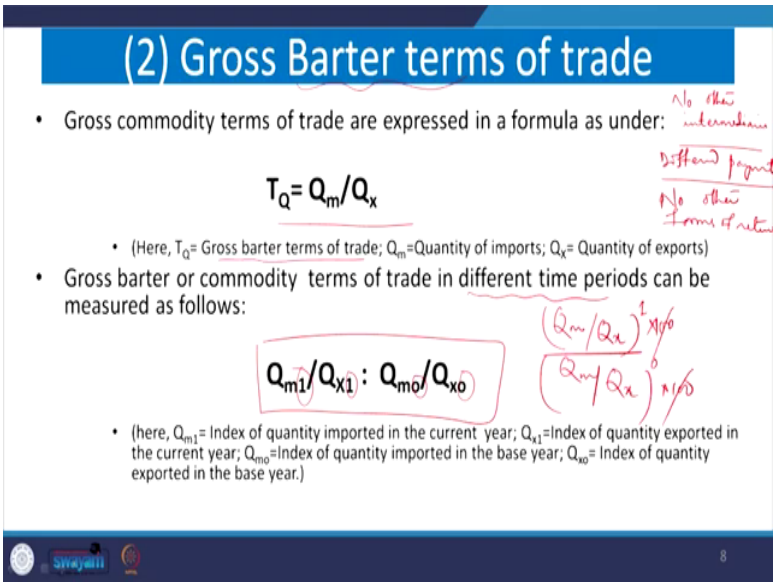

So far as gross commodity terms of trades are concerned, since initially we say price of export import, but in case of commodity or gross barter gross barter terms of trade not the relative or the net, net is usually expressed in terms of relative changes that is reflected with price of X by

price of Y. But now due to the you know approach of understanding terms of trade through quantity production or quantity traded, we feel that just the ratio of is clarifying the concept, quantity import divided by quantity exported times 100.

So, T Q stands for gross barter terms of trade and Q m stands for quantity of impose and Q x stands for quantity of exports. Now, similarly if there are different time period to compare the gross barter terms of trade. Why? Whereas in barter terms of trade because goods are exchanged with goods.

Goods are exchanged with goods, there is no other intermediaries, no other intermediaries. Or alternatively you can say that there is no differ payment, no deferred payment or another interpretation is like there is no other forms of return, no other forms of return or no further of terms of exchange. So, therefore, we interpreted is barter terms of trade, exchange with you know one exchange is reciprocated with another exchange of goods.

Now, here as for the time differences, similarly 1 stands for the current year, 0 stands for you know base year. Now, this is basically the Q m by Q x of period 1 divided by Q m by Q x in period 0, and 100, 100 in both the side cancelled. So, the net result is only the ratio of these two.

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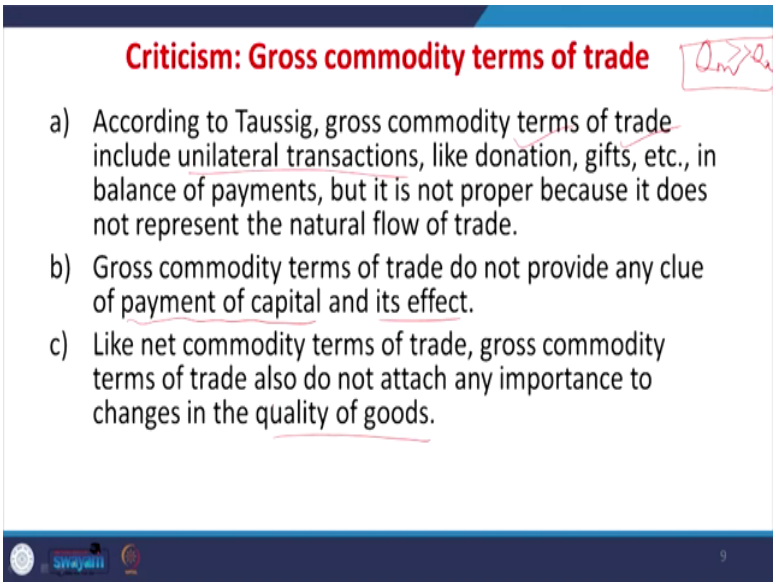

Now, is it a better method? So, let us understand. So, as my point how Taussig the gross commodity terms of trade include unilateral transactions like donations, gifts, etcetera in balance of payment. It is actually not a natural flow of goods in the trade basket. So, therefore, if it is not representing the natural flow goods.

Now, only we consider total you know quantity imported and total quantity exported, so in either in different time periods. So, now, have your separating the unilateral transfers. So, what do you mean by unilateral transfers? If the country only gifts in terms only donate or it only gives you know one direction transfer in terms of donation, in terms of gifts. So, now, in the trade basket Q m if it is the fact Q m much far exceed Q x which is actually not right or not rightly representing the terms of trade through the measurement of quantity terms of trade.

Now, similarly; so, similarly this does not provide any you know clue of payment of capital and its effect. Only we are confining ourselves to the discussion of exchange of quantities or commodities, whereas the quick procure payments are not discussed, payment of capital and its further effects are not discussed.

Even the same was discussed in the net barter terms of trade where the you know unilateral transfer or the other forms of transactions are not discussed. Like you know I mean it is purely based on barter terms of trade, so only other linkages to the transaction are not discussed in this method.

Like net commodity terms of trade as we mentioned before, this method also does not authorize an importance to the changes in the quality of the goods. So far the quality of goods which are being traded are not discussed correctly, which quality are actually imported or exported, whether after trade the quality of the product is good or bad, is nowhere discussed and how it impacts terms of trade is not emphasized, therefore certain new methods are important for us for discussion.

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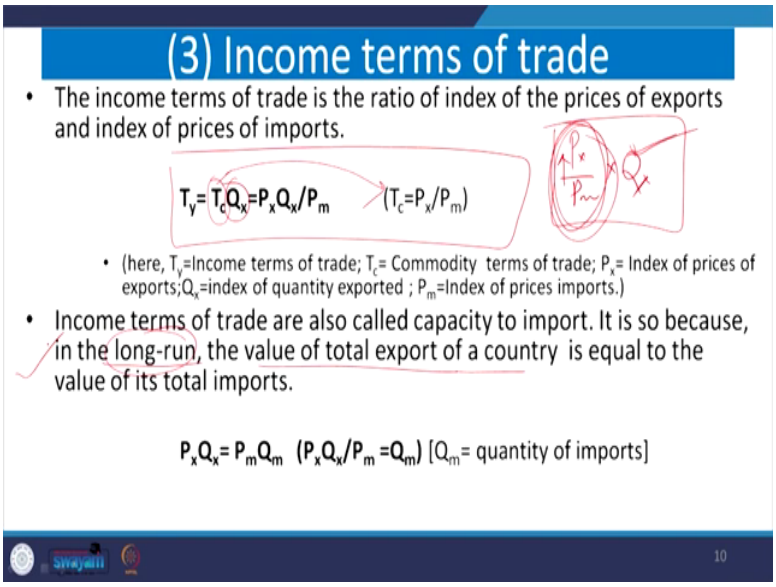

Now, another approach of measuring terms of trade is through income terms of trade. How much income earned by earned as a ratio through export or through import?. So, far we discuss Q x in the previous slide. So, T Q we discussed, now we are discussing a little bit different that is you know in terms of income. Income terms of trade is the ratio of index of exports, price of exports, so and the index of price of imports multiplied with another component called quantity.

Now, it is actually equal to T c times the terms the terms at which trade takes place, terms at which trade takes place this is nothing but the you know but the net barter terms of trade, nothing we already use the notation in the earlier you know measurement or net barter terms of trade, times the quantity. Basically, the rate at which we exchanged their goods times the extent of quantity we are exporting, ok.

So, that defines the I mean times the quantity. I mean this defines the income, the total earning, earning of the country of its exports. So, basically it is of P x by P m into Q x. So, far as the income terms of trade is concerned quantity of exports are multiplied to derive the income earned through our exports. So, net prices, net terms times our exports is more important.

So, net if it is relatively higher, if P x is relatively by fraction higher than that of P m then the out of the total quantity exported our value is positive our value is greater than 1 and is favorable, where if it is less than 1 still not negative, so it will be in fraction. So, I mean it will be this I mean unfavorable to the trade. So, income terms of trade are also called capacitor import. What is the you know value we are earning after multiplying quantity and without value do have the capacity import. If our value is actually less, so therefore, our import basket will be also less.

So, it is therefore, defined as a long term, long run you know approach, since the total value of exports of a country is equal to the value of total imports because whatever the total value we are multiplying the value of exports of a country by multiplying these with the relative prices. So, this is nothing, but going to be you know realized in terms of; in terms of you know imports further in the long terms.

So, whatever the earning we have, so is not it the earning can be actually you know use for imports. So, therefore, income terms of trade is a long term phenomena one of the very important attributes we attached due to these reasons. So, whatever we want through relative prices of export to import through exports we can you know materialize to imports in the long run, since these two are value are equal in the long run. I hope it is quite understood to the context of measurement.

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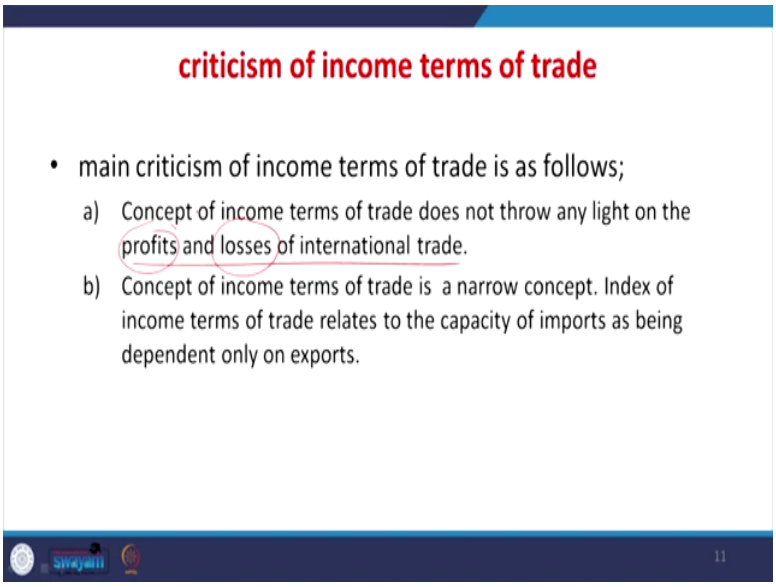

Now, it is also not free from you know many criticisms, some of are very important. So, the main criticism or the terms of I mean income terms of trade are like you know it does not through any light on the profit and losses of international trade, though we are saying we have earning, but those earnings are actually you know again used for imports. So, the terms of trade is not attach any international profits or losses.

So, the balance of payment aspect of whether it is favorable balance of payment or surplus balance of payment or not is not actually addressed that is one of the import and criticism. Similarly, it is defined as a very narrower concept as very narrower you know definition because of the fact that the you know, so because of the fact that it relates to the capacity of imports as being dependent only on exports.

There is no other approaches by which exports are derived, only or our imports are derived or imports are made. So, as if you know countries not having any problem or deficits because in fact, that it imports what it exports. So, it is very narrowly defined.

So, similarly there are other you know approaches which we discusses you know the terms of trade, like you know so far we discuss short run, then we discussed long run it to some extent, we also discussed you know the absolute one, the relative one. Now, there are many questions related to productivity, ok, productivity constant, productivity constant or utility constraints while measuring the terms of trade. So, one way of understanding the priorities through single factorial terms of trade.

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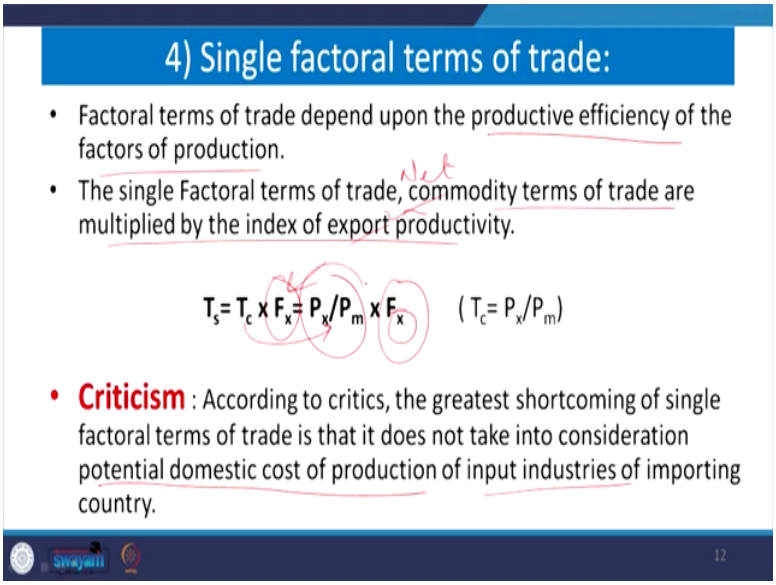

So, this depends on factoral terms on the productive efficiency of the factors of production. So, productive efficiency of the concerned factor which are utilized is also quite important to

look at. So, single factoral terms of trade where where referring to yes you know single factor single factoral terms of trade, the commodity terms of trade are multiplied by the index of export productivity.

The commodity terms of trade times the index of the index of factor productivity are actually multiplied, index of export productivity, whatever the export we we made or we make we are going to make does it have productivity coefficient. If that is multiplied then the net I mean basically the net these are multiplied by the net commodity terms of trade are multiply with the export productivity.

Now, this is nothing but; this is nothing but this multiplied this. So, out of our you know net barter terms of trade how much of it actually connected to the you know factor productivity. Now, factor productivity it is very difficult to measure. So, therefore, there are number of critics, on it according to the critics the greatest shortcomings of this single factoral terms of trade is that it does not take into consideration potential domestic cost of production of input industries of importing country.

So, it only talks about the export segment, the productivity. What about the import? What are the you know potential domestic cost of production of the import? Because just importing a product and the industries are attached to importing the product it also attaches you know number of cost and its efficiencies. So, therefore, the import segment is missing and is one of the criticism.

So, somewhere there are many instrument by which you can measure the productivity of a single factor. So, those instruments are not being discussed in the lecture, those are a part of other discipline, other particular you know specialize purpose. So, here we have only concerned with what is important in you know single factoral terms of trade. So far is since it was criticize in the single, now in the double factoral terms of trade.

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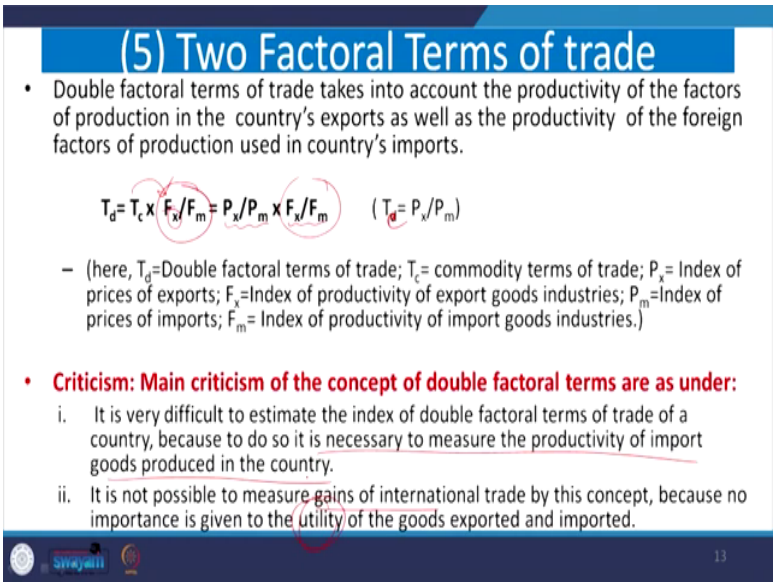

So, most importantly we are taking these times is a ratio, it is not just export we are also consider the import part. So, what is this broadly? It is this component T c, this is actually T c, T c times ratio of the factors of the to I mean factors of import as well as factors of exports.

So, double factoral terms of trade takes in the account, the productivity of factors of production in the country exports as well as the productivity of the productivity of the foreign factors of production used in the countries imports. So, foreign factors used in the imports and our factors and the domestic factor use in our export basket. There is a ratio that determines the you know two or double factoral terms of trade.

Now, the criticisms are the following. It has you know some criticism, the main criticism ours is very difficult actually to estimate the index of double factoral terms of trade of a country because of the fact that I mean you know because you know the major productivity of import

I mean basically because to those so it is necessary to measure the productivity of import goods produced in the country. It is necessary to measure the productivity of import goods produced in the country, so which is quite actually difficult to do. So, it is also not possible to measure the gains of international trade by this concept.

So, gains from trade from this concept we are only to concerned with the productivity differences which are responsible for trade and the gains are not defined in this methodology and because no importance given to the utility of the goods exported imported how much utility is actually derived from the import or the exports. So, these are not discussed correctly.

Now, similarly I mean therefore, they are new concepts are defined. So, one criticism of this double factoral is though it is including the productivity of the import basket and the how it is adding productivity how the foreign factors are productive and of it is very difficult to calculate, ok. So, that is one of the aspect. Now, we are jumping into the methodology which are confined to the utility of the; utility of the terms of trade, utility of our basket of terms of trade, utility, based on utility pattern or the welfare out of it.

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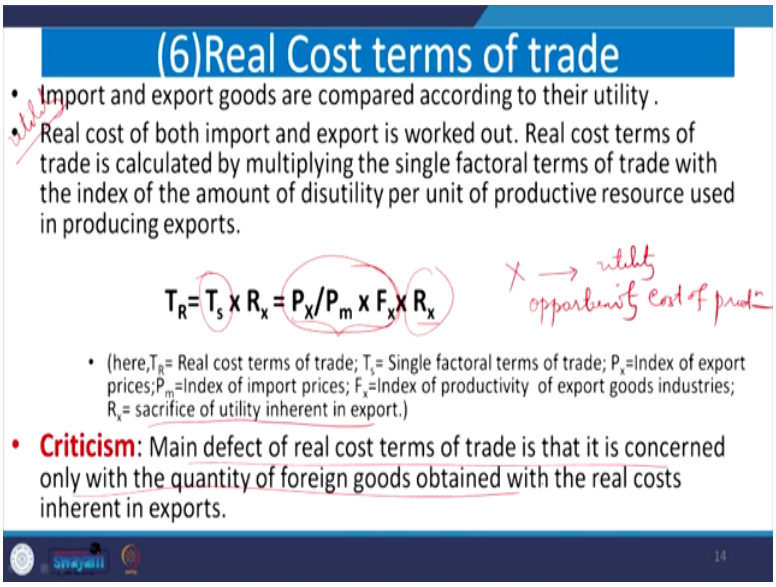

So, what are the real cost of terms of trade? So, therefore, the real cost as a term is defined. So, import and export goods are compared according to the utility as I just mentioned. So, real cost and the real cost of export is only imports are work out. So, real cost of term is calculated by multiplying the single you know single factoral terms of trade with the index of the amount of disutility per unit of product resources those have been foregone or resources those have been used for exporting.

For example, T s is used here T s times R x. So, R x stands for the sacrifice of utility inherent into the exports. We are exporting for sure, whenever we export we actually forego our utility, we actually forego our utility. So, how much utility has been foregone in order to you know get the productivity of the factor for exports? So, therefore, it is the single factoral you know terms of trade times the utility foregone.

Now, if you multiply it we find the total utility foregone for the purpose of that. So, this actually measures the exact opportunity cost opportunity cost of production for exporting a product. So, this measures our utility those are (Refer Time: 31:05) but actual that therefore this exact valuation of our product. So, the criticism is very difficult to measure, so one main defect real cost is a it is concerned with only the quantity of foreign goods obtained with the real cost of product which are exported.

So, what about the import, those are imported and what kind of utility we have added due to foreign goods those are imported, these are not discussed. So, therefore, the utility terms of trade is actually defined where we are including the complete utility times these T R is now considered, T R this which is nothing but till this, times the utility.

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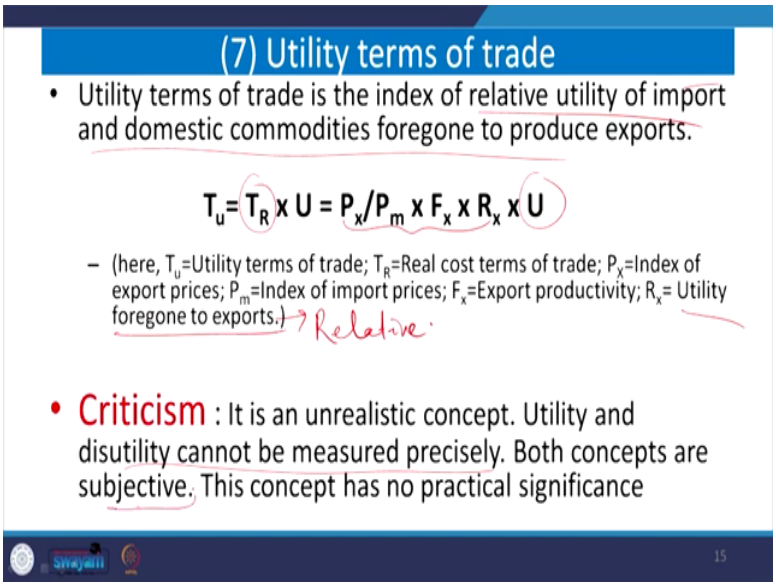

So, what do you mean by utility here? So, utility is utility foregone to exports and the total utility now utility terms of trade is the index of relative utility. So, basically this is not just utility, this is relative utility per say it is relative utility, import as well as export product. Import and domestic commodities foregone to export the products. So, it is not just exportable products the importable product as well. So, I mean one of the criticism which is very important to discuss is called is due to the fact that is on realistic very difficult to measure.

A utility and disutility concept can be measured precisely, both concepts are subjective, very subjective you know. This concept has no practical significant we can say.

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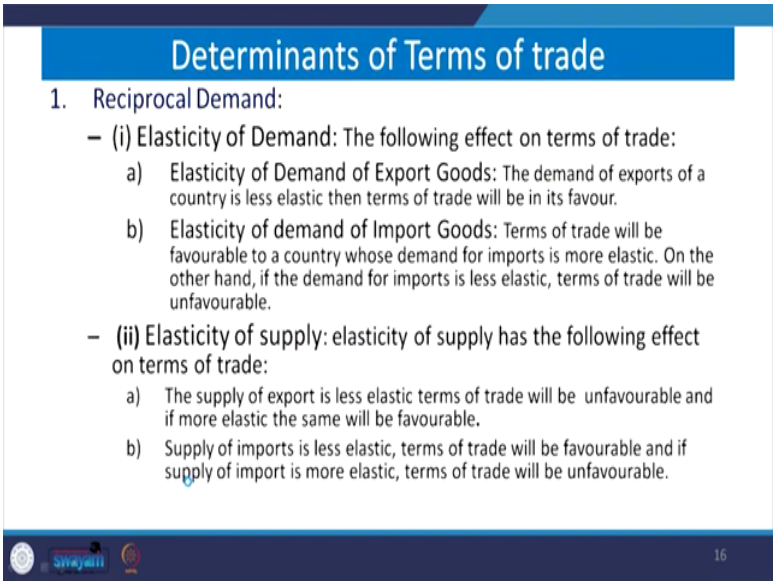

So, now there are other aspects. So far we discussed different measurement of trade. Now, I think we have already consumed the time for covering less we will probably extend the

determinants of measurement, what affects terms of trade in the next class in detail. Next class we will talk about what really affects and how and what are the impacts of terms of trade. So, we will enfold the determinants in the next class systematically.

With this I think I should stop here.

Thank you.