Strategic Trade and protectionism Theories and Empirics

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Lecture – 16
Imperfect Competition and Trade

Welcome once again to the NPTEL module on Strategic Trade and Protectionism. We are now explaining a new chapter to the addition as an addition to imperfect competitive market, as an addition to international trade theories and deriving the you know complicated strategies, which are responsible for trade and accordingly the countries can able to tap benefits out of it.

Now, based on our last week discussion last week lecture, we discussed largely on Heckscher Ohlin model availability of resources that determine trade or specialization, but you know ultimately based on the you know classic new classical approach we discussed imperfectly competitive you know imperfect specialization because of trade.

Now, in this week we are here to explain the classical theory not necessarily valid. So, what why the need for a new theory is required? Though imperfectly competitive model which is the focus of this particular lecture and its implications on trade the strategies. So, this is I mean though it is important, but we are largely again explaining new classical theories with certain you know assumptions are relaxed.

So, the title of this presentation this lecture is on role of imperfect competitive market instead this is lecture number 16 and we have you know we have now arrived in or we are now explaining week number 4 details. So, myself Pratap Mohanty faculty in IIT Roorkee in the Department of Humanities and Social Sciences.

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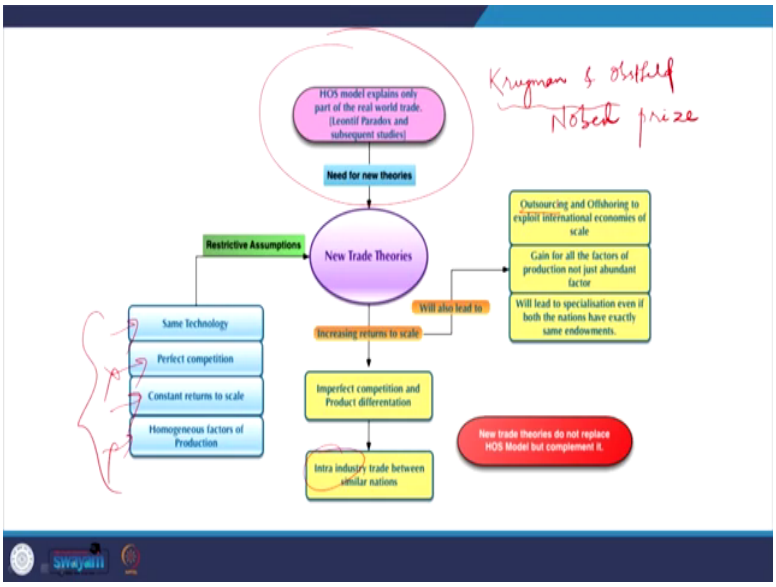

Now, let us have a complete outline of the new trade theory. First of all in the last class we have I have shown this flow chart, now let us read between the boxes. Here we say HOS model explains only part of the real world. Why real world? Because there are lots of criticisms also through Leontief Paradox or also through or the subsequent studies you know like props and mean time studies on factor intensity reverse reversal, we also added certain extension to that theory.

Because it goes by a very you know limited version of assumptions some assumptions are not realistic. Like assumptions like you know the production function, though is most advanced than that of the classical one. They assume that it follows a you know increasing cost function, but the production function follows constant returns to scale.

So, it is non-linear, but they the you know expansions path follows a constant array or constant direction which is you know highly criticized by the or identified by the new theory. Specially, in the works of Krugman, Professor Krugman and Obstfeld because of Krugman and Obstfeld. So, and already received Nobel Prize for it.

Now, so a number of restrictive assumptions are again you know relaxed like same technology is not assumed, perfect competition not necessarily followed, constant returns scale I mean is rejected this is also rejected, homogeneous factors of production also rejected. So, these are very important assumptions which are relaxed.

Now, based on this we have we are here to explain increasing returns to scale function, which is quite natural in the present days production function. So, which is I mean eventually the increasing returns to scale and it is you know its position in the production function result in perfect competitive structure. And imperfections in the market differentiate products; differentiate products by quality by their safe by you know certain you know features.

So, which again you know eventually lead for possibility of intra industry trade is also discussed here trade within the same you know form or industries, And that also lead to this also lead to outsourcing because you know in order to differentiate the product and to minimize the expenditure.

So, as I already discussed in the last class some beta of explanation on it that the products can be produced qualitatively by outsourcing its unit, either by outsourcing or off shoring. Either you are you now outsource and assemble in one place or completely you assemble also in another place. So, it is off shoring. So, which also exploit international economies of scale, here we are emphasizing economy of scale which is a result of you know increasing returns scale function.

So, gains for all the factors of production not just abundant factor. So, it actually cannot contradicts the conclusion the bottom line of earlier function. So, therefore, it leads to

specialization even if both the nations have exactly the same endowment, because of the fact that qualitatively the trade is possible to you know differentiate the product qualitatively.

So, that is the bottom line of today's lecture and even in the next lecture we will that you know examine with the help of certain instrument certain numerical or through equation. Now, what are the background? Further backgrounds to I have already said new classical model assumes industry a perfectly competitive and exhibit constant returns to scale and sell homogenous products, whatever they specialize they will say homogenous products,

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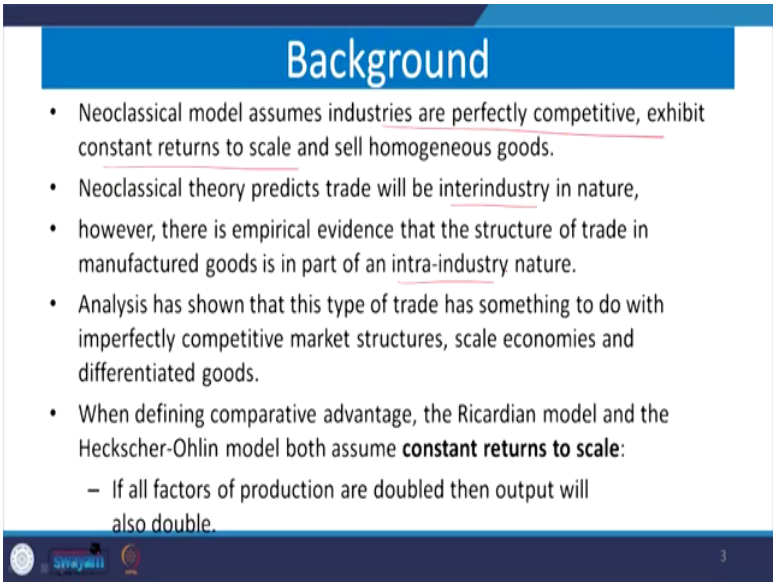

Neoclassical theory also predicts that trade will be you know interindustry in nature no question of intra industry in nature. This is another important features we discussed. However, the empirical evidence suggests that, the structure of trade in manufactured you know goods is

part of any intra industry nature. So, it is in present days actually no question of just interindustry or possible to intra industry as well.

The analysis has shown that, so this type of trade has something to do with imperfectly competitive market, which is you know due to the scale economies and differentiated goods. I mean the result of increasing returns to scale in the production function is of differentiation in products. So, while defining comparative advantage the Ricardian model and the Heckscher Ohlin model, both assumed constant returns to scale which I have just said, both assume constant returns to scale. If all factors of productions are doubled, then product will be also doubled.

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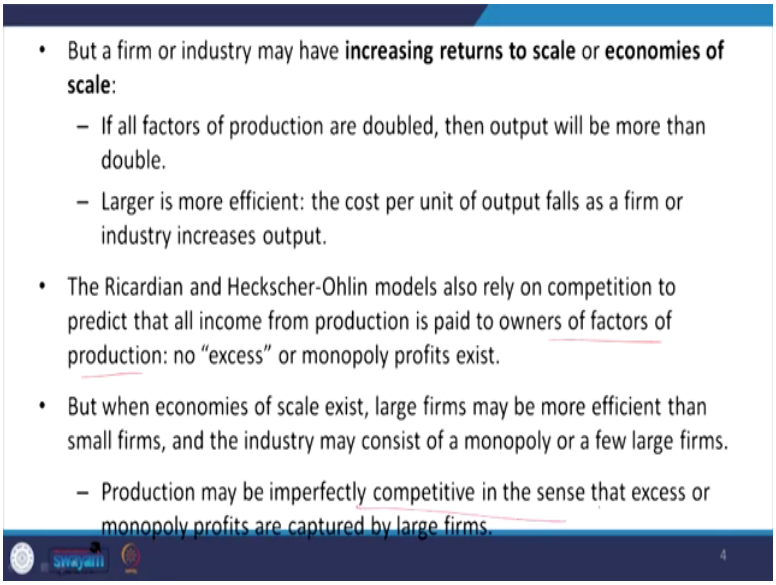

Then what is that is the meaning of you know constant returns to scale, but a firm or industry may have increasing returns to scale or economy of scale which I have said. Which means that if factors are double then output will be more than that of the extent of factors applied.

So, larger; so a larger is more efficient, that means, larger the outcome it is the industry is more efficient and can differentiate or as an age over another industry. So, therefore, Ricardian and Heckscher Ohlin model largely rely on competitive you know setups and they predict not all income from production is paid to owners or practice of production. So, there is no question of excess or monopoly profit exist.

So, actually in reality you know company always you know have some tendency to differentiate themselves or enjoy market power and they you know they defined to be leader for sometime. So, these are the very common phenomena which have been largely neglected in the earlier theories. So, when economies exist, so large firm are usually efficient, then the small ones. So, therefore, the argument of small versus large is very important.

So, industry may also consist of monopoly or a few large firms. So, production may be imperfectly competitive in the sense that excess or monopoly profits are captured by larger firms as we discussed just before.

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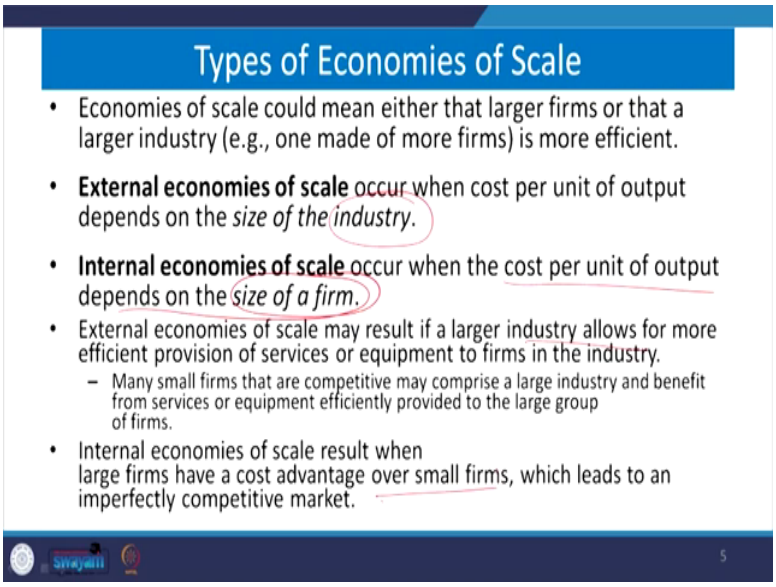

Now, how to then you know go for this new theory and how to approach for this new theory, let us understand what is economy of scale in detail. Probably economy scale which we say that the average cost of production actually reduces as compared to the extra unit of its production.

Now, this is also defining their efficiency level. So, large is the firm higher economies are expected, again economy of scale are derived based on scope or based on scale. Scale economies or scope economies people also there economy is defined as horizontal economies and vertical economies to you know minimize the average cost. In simple term if you have a you know in case of vertical economies, we are here to you know specialize on the same varieties with a large number on the same varieties which could able to minimize the cost.

And second aspect is instead of for the same variety, we can add little extension of that variety horizontally. For example, if you are producing a company can produce some plastic items, maybe plastic bottle, maybe plastic box, maybe plastic bucket in these direction the you know firm can able to tap these differences very clearly; very clearly.

So, what firm how firm can able to you know minimize the cost? As I just said if we site an example of plastic bottle. So, if initially the company or the firm can able to generate thousand plastic bottle and they have capabilities to produce plastic boxes also, because it hardly had any incremental cost.

So, what is important here is the following. The firm if add related products with this almost with the same setups can able to tremendously reduce their average cost, is not it. So, in that context if we fail you know there are possibility of horizontal extension. So, horizontal economies are also expected to add, vertical economy or horizontally these are called economy of scope. You know there are other way by which you know the external I mean economies are added through you know external channels or the internal channels.

So, external economy of scale define as per unit output per unit you know cost per unit of output, which gets you know changed depends on the size of the industry. So, if the industry size increases per unit of cost or cost per unit of output gets changed. Whereas internal economies defined as cost per unit of output depends size of the firm the individual firm and its output increases, then there are high chances of internal economies.

So, there are two way which is very important to discuss. External economies of scale may result if a larger firm or larger industry; larger industry allows for more efficient provision of services or equipment of to the firms in the industry. So, similarly you can converse we will discuss for the small firm as well. Internal economies of scale result when large firms have cost advantage over small firms, basically within the firm which leads an imperfectly competitive market. So, we are largely emphasizing here internal economies.

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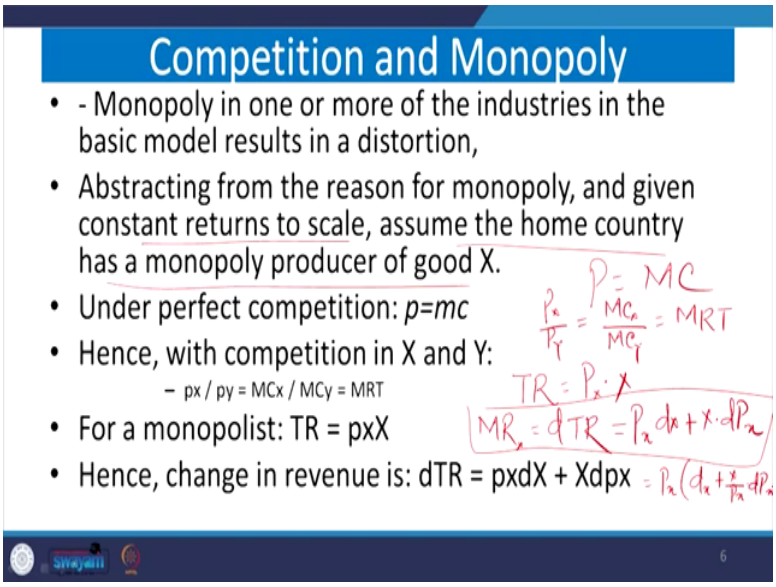

Now, let us compare competition as a an extension to microeconomic theory, then deriving you know economies out of it, economy of scale out of it we wish to discuss you know how competition and monopoly are actually different and by which approach they are different.

So, monopoly in one or I mean we as we know it is of one or more of the industries in the basic model which resulted in a distortion, because monopoly you know usually you know occupied by the individual firm. So, individual firm may largely you know minimize their expenditure their cost. So, average cost of production actually gets minimized.

So, you know abstracting from the reason for monopoly and given constant returns to scale we assume the home country has a monopoly producer of good X. Let us assume by this, so that we can proof differently. So, given the constant returns scale and assume the home

country has a monopoly producer of good X. Under perfect competition what will happens? Price gets equalized with MC, price is equal to MC.

But whereas, you know I mean if it is a perfectly competitive market, we know that the equilibrium exists where p x by p y is equal to its marginal cost of one industry with marginal cost of another firm, that should be equalized MRT, which we have discussed several times ok. Now, whereas in case of monopoly we wanted to discussed in a very different manner.

What is that? So, in monopoly set up, let us define given this assumption, let us define total revenue of the monopoly firm is as p x into number of product produced that is called total products. Now, what is the marginal product? Marginal product of or X, which is simply you know delta or a d of TR which is actually equal to if you define it p x into dX basically p p x into dx plus you know X into dp x. So, this is what called marginal revenue.

Now, next to it we just wanted to differentiate the you know markup pricing enjoyed by the monopolist and how this markup price is actually responsible for you know intra industry trade or leverage in trade and differentiation, I mean differentiate products as an outcome of these markets, if you wanted to arrive there through the equations. So, this is what here we defined.

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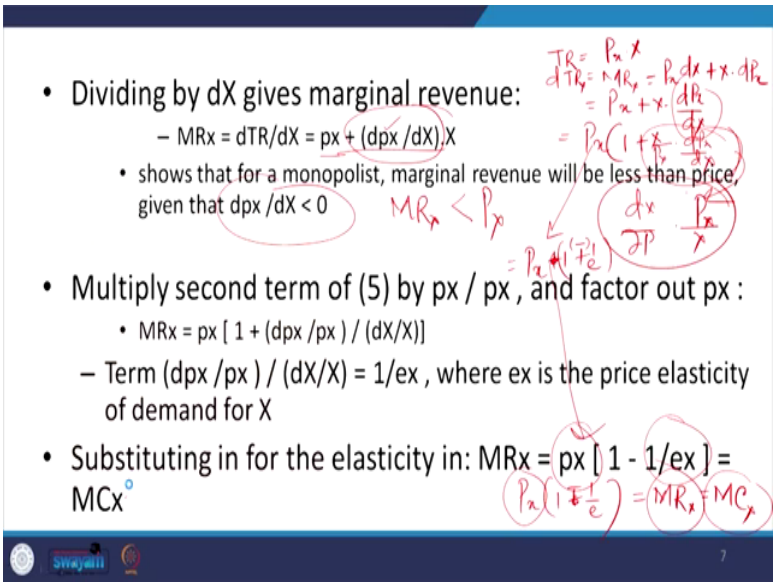

Now, let us from the previous equation let us take p x outside or factor out p x. So, this has resulted in, if I take p x out, so this will be basically p x here. So, the dx plus here x by p x into dp x, this is what is the result, dp x if I you know take outside then this is the result ok. So, px is come on or either if I divide it by dx no if I dividing by dx then this is the result, from the equation if I simply divide d dx, what is left? px plus x into. So, let us write it down again in the next slide.

So, we say TR which is equal to px into px into X, now we say dTR which is equal to MRx a marginal revenue of X which is equal to px into px into you know d of X plus X into dp x, this is what we have said. Now, let us divide it by dx to you know arrive into the conclusion. So, it is px plus x into dpx divided by dx ok. Now, this is what is explained here all right.

Now dpx; dpx divided by dx into X is written this shows that for a monopolies marginal revenue will be less than price, because you know marginal revenue is now added. I mean you know will be less than price given that this should be less if this is less than 0 df dp x by dx, if the slope the change of price once it gets you know, if every additional change in the prices is lesser and lesser.

If it is negative then m marginal revenue of the successive items or successive productions will be less than that of the px. And if this component this component is negative and usually this component is negative, because you know their demand curve is downward sloping. So, now let us you now multiply the second term of 5 here 5 equation number 5 wanted to mention here by px by px.

If we multiply the or factor out by px what it resulted if I just take px outside, if I just take px outside. So, what is left here simply if I take px outside this is 1 plus X by p x. So, this is you know X by p x d dp x by dx ok. So, this is what is written, Now, the term d dp x by dx or in reverse. Now, look at this carefully, I mean if we just in look at differently in a reverse term dx by d p into p by X p by X, this is nothing but elasticity of demand.

So, price elasticity demand and here it is just the inverse. So, it means px plus 1 plus 1 upon e ok. So, the elasticity price elasticity demand for X. Now, substituting these you know in the elasticity, we will get the elasticity function like this. Since elasticity of demand is by virtue it is negative. So, equation boils down to this px. So, this is basically px or we have taken px outside as common.

So, it is not plus it is actually px times one plus one, I mean now it is not plus it is minus because you know by structure elasticity demand is negative. Since you know price and quantity are inverse related by demand. So, and this is equal to marginal revenue of X from there we have derived this is also equal to marginal cost of X. Now, what is important here? What is the important interpretation here?

So, interpretation is that look at what is the marginal cost and how this is you know comparable to price and these are marginal revenue and how it is comparable to comparable price of the product. Now, we have earlier said in the perfectly competitive set of marginal revenue is equal to price effects. But now these two terms are not equal that will be that is actually factor about factor factored out by certain extent of ah elasticity of demand.

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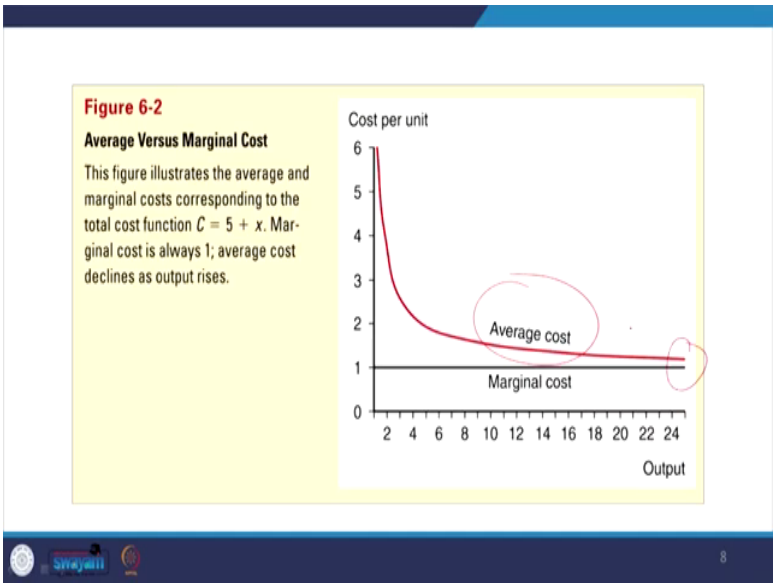

Now, in this context I wanted to give you a background to it. Now, how in the present days those who are the you know price leaders or the firm with you know with huge, you know expertise or the firm which are efficient enough have been consistently reducing their average cost of production.

And due to that they claim is the you know claim is the leader in the market and they have certain monopoly power in the market. So, those these type of you know natural outcome

derived from their efficiency in the production pattern lead to defined as lead to be defined as natural monopolies. And in case of natural monopolies it is not just natural monopolies we are defining natural monopolies, where the their average cost is consistently reducing.

So, since the average cost is reducing the each of the and those type of company can take advantage out of out of it and can reduce their prices consistently till the level of attaining their marginal cost level.

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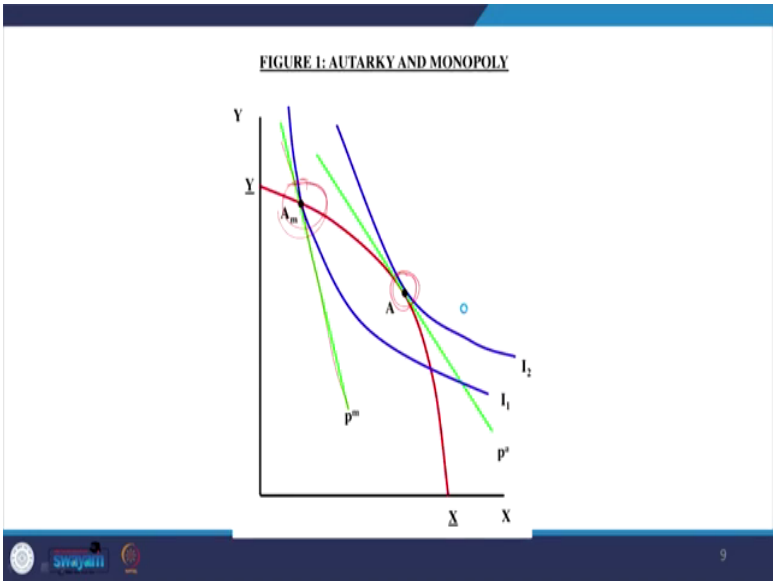

So, therefore, the company tap the benefit out of it differently. Now, in this diagram we wanted to mention certain important features. Now, here the perfectly competitive set of where all the all the you know items like MR px by py or MRt marginal rate of transformation all are equal.

But if there is possibility of monopoly power attached or monopoly power attached in the market, those firms can able to minimize their cost of production and they may claim certain extent of monopoly in the market, their prices are now different.

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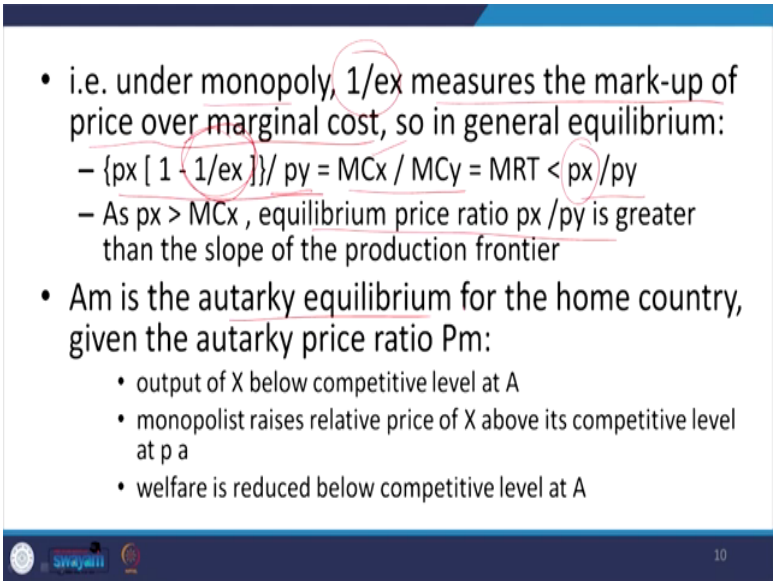

Now, this is mentioned here we will interpret it under monopoly given 1 upon, I mean inverse elastic function measures the markup pricing markup price over marginal cost, because this is what you know the marginal cost differs from firm to firm.

Now, the equation which I have said is here. Now, our px by py instead of px by py it is actually markup by the extent of inverse elasticity of demand no elasticity of demand of that particular product. So, in now px is attached with a you know elastic demand divided by p y which is equal to MX. I mean marginal cost of X up on marginal cost of y which is will be

equal to MRt of X and y should be less than that of px by py, because you know since elasticity this component is negative in the equation if you read it carefully.

Since this is negative the you know the marginal cost or the marginal cost is actually factor out by the extent of elastic demand ok. So, price; so price is actually higher than that of price they are charging is higher than that of marginal cost. Now, look at here the price the relative price of X is higher than that of the marginal cost. So, as px is higher than that of marginal cost equilibrium price ratio that is p x by py is greater than that of the slope of the production frontier ok.

It is given here the slope is now relatively higher because of monopoly pricing. So, A m is the autarky equilibrium, we have already said A m is the autarky equilibrium given the cases of monopoly power in the market. Now, why is it so? Because the relative prices is higher due to the extent of elasticity of demand they vary given their natural production in a market.

So, it is not equated with the marginal cost, now you know the pricing is the higher than that of the pricing of the product is higher than that of the unit marginal cost. So, A m is the autarky equilibrium, we have already said for the home country given the autarky price ratio Pm. Out of out of X below competitive level at A. So, now, monopoly power enjoys differently.

We have already said at a different point and accordingly the tab the benefit.

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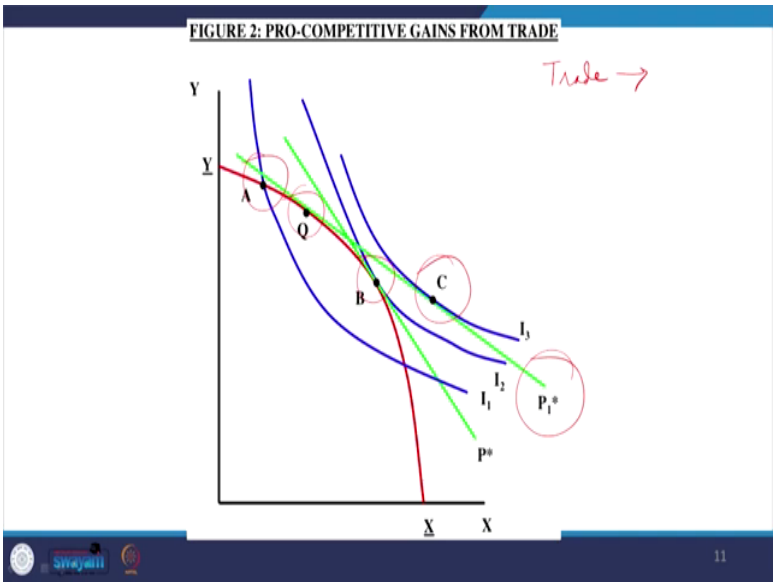

Now, let us understand if it is pro competitive if the monopoly gains are actually made competitive enough. So, if it is pro competitive I mean gains because of I mean if the monopoly plot translated into some sort of you know competitiveness in the market.

And specially this is derived due to trade; trade before I mean during autarky or before trade or in autarky situation there are high chances of enjoying the monopoly power, but when trade takes place the demands and supplies are now you know now exchange the global level. So,

there are more number of competitors there are high chances of getting better competition in the market.

So, due to which the monopoly which you have defined at point A during autarky is not necessarily going to be you know enjoyed. Now this is competitive market price, now due to trade they may able to reduce the price level in the international market, even near even better than that of the competitive scenario and due to the exchange effect also they will land in a higher you know consumption level, because of differentiation in the products.

So, therefore, the trade or the pro competitive gains out of trade help the consumers largely and country will get huge benefit out of it. So, what kind of I mean we know it that you know monopoly power often distort the market.

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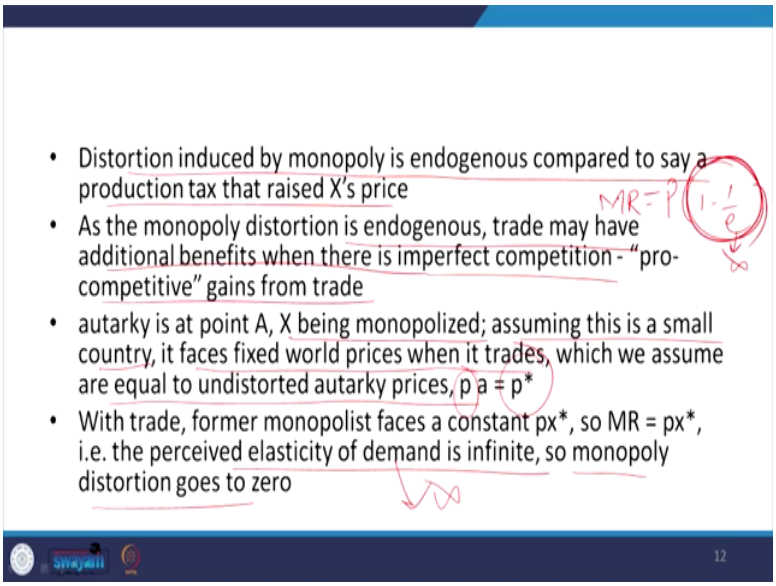

So, distortion induced by monopoly is endogenous compared to say production tax, there is. Now what I wanted to emphasize here? Endogeneity of monopoly power. Often the case many firms endogenous the monopoly power to differentiate their product, but after trade that gets neutralized in for the consumers as well as is for the producers.

Because they get larger market for the producers and for the consumer they get different new variety of products. So, is the monopoly distortion is endogenous trade may have additional benefits, which I just said there is imperfect competition. So, pro-competitive gains are arise due to trade.

So, the autarky point as you know used to be defined at point A, now which have discussed before at this on this figure is no longer going to be defined. Now, the autarky point is going to be changed and X being monopolized competitive X being monopolized assuming this is a small country, it faces fixed world prices faces fixed world prices when it trades.

So, which we assume are equal to undistorted autarky price, this means that you know if X being monopolized in the country, we are assuming to be small enough they faces you know fixed world prices when it trades. Because after trade now they are no longer monopolize monopolizing the particular product. Therefore, I mean p a this is not in time it is only p; p on monopoly price is equivalent to the p star.

Because now they are opened off the country will be more competitive. When you know so we trade for monopolist faces a constant p x. So, again equalize with the extent of marginal revenue. The perceived elasticity of demand is infinite. So, monopoly distortion goes to 0, because you know elasticity demand for the market in the international market is going to be infinite for their product.

So, since you know since it is p times 1 minus 1 upon e. So these you know approximate to infinite. So, the value of the you know this one is equal to 0, so 1 upon infinity 0. So, it will be equal to p. So, MR now equal to equalize with fee after trade.

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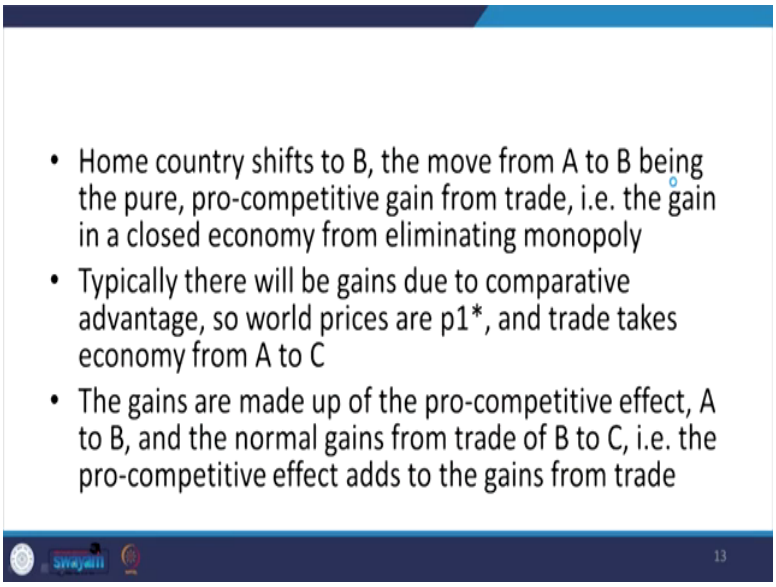

So, therefore, the economy of scale which are enjoyed by certain firms and can able to internalize in their production function which differentiate the product. And give lots you know a variety of you know products to be consumed by the consumers and give better markets. So, lead to huge competition and that competition is going to be robust.

Now, in another couple of slides within 1 minute I am going to talk about you know, what do you mean by the monopolistic competition? We have said monopoly. In monopolistic competition largely there are more number of firms, which is evidenced from you know international market and due to globalization and firm produced differentiated products, which is a natural outcome of economy of scale.

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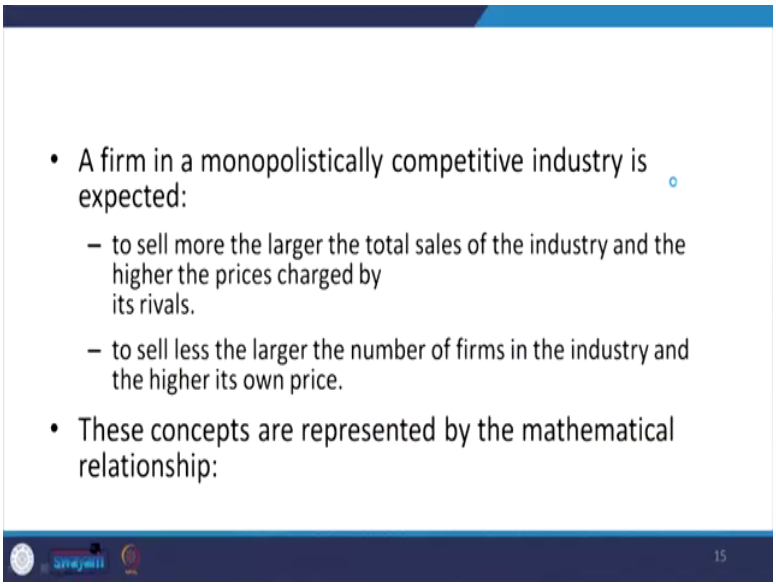

And they can able to sell different.

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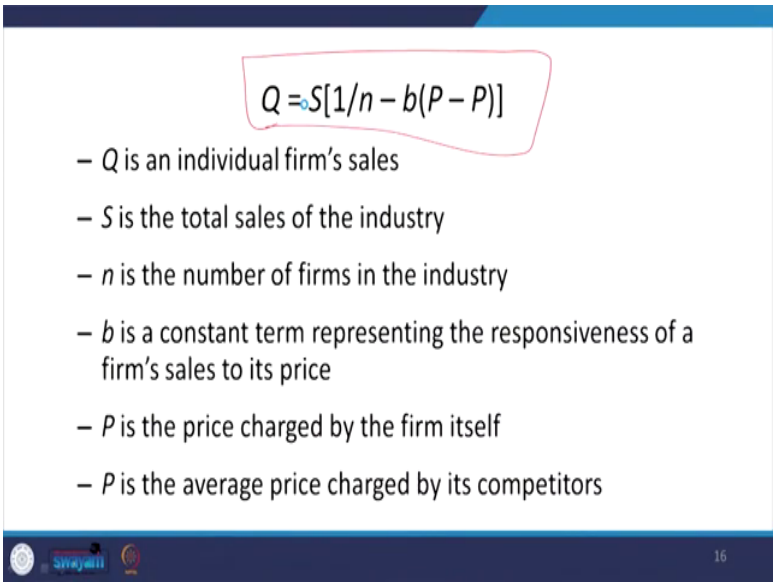

Now, we will discuss in the next class on how an individual firm faces different extent of you know their product given the fact there are other competitions. Now, these are some of the you know area.

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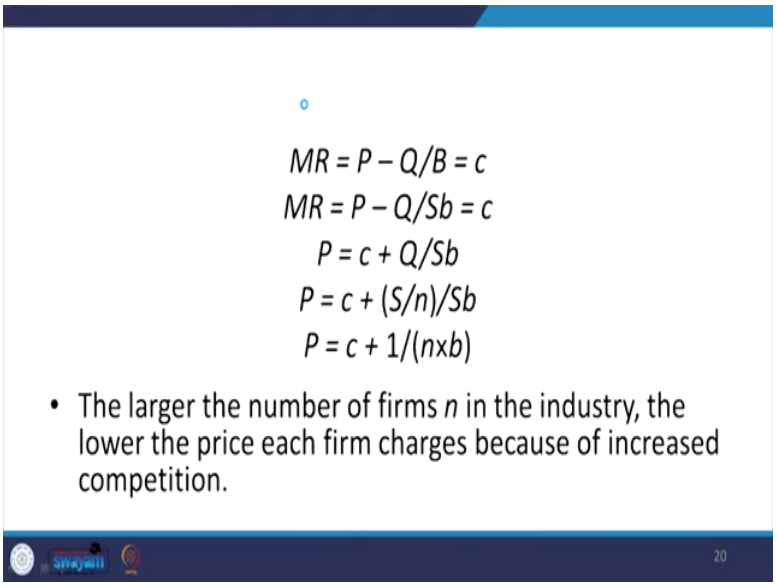

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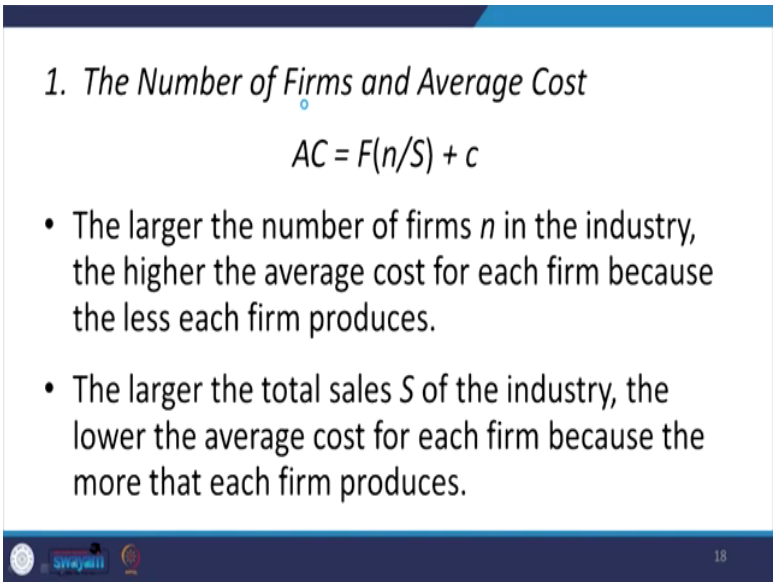

I mean some of the numerical equations which will proof, that whether monopolistic competition is going to differentiate the production and also simultaneously make the market very competitive.

Now, we will carry forward this discussion this particular discussion, specially for the monopolistic competition and some kind of game theoretic strategy; game theoretic strategy in the next class.

And in between just one thing I will suggest that you know what kind of questions you must prepare here, try to prepare the complete features of monopolistic market. We may ask you how monopolistic competition you know in the in the trade context helps countries to grow and how monopolistic competitive behavior or the economy of scale of production minimize the monopolization strategies, once the country is opened off. This type of discussion you may

go through in between it will be very easy to you know understand correctly in the next class. I think I should stop here, we will continue in the next class.

Thank you.