An Introduction to Microeconomics
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Lecture – 106
Short Run Vs. Long Run Cost Minimization Through Graphs

Let us look at it graphically the same thing.

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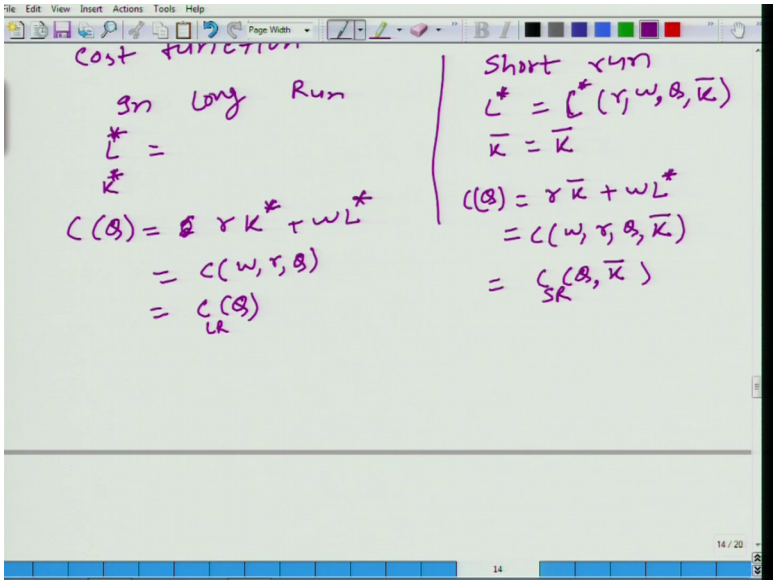

What we have here is if we try to draw the isoquants, you have already studied isoquant. What do we mean by isoquant?

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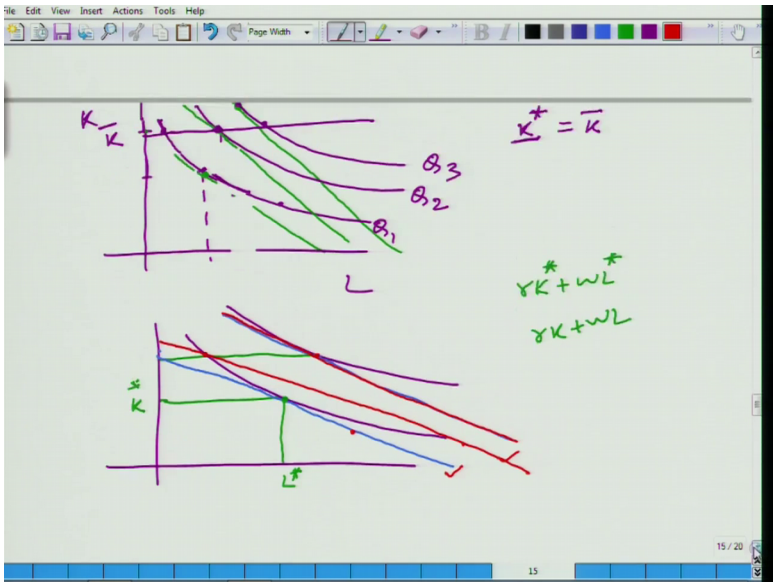

Student: (Refer Time: 00:27).

Same amount of output. So, what we have here is L, here we have K fine and isoquant in the Cobb Douglas case is going to be like this of course, it is not things like that Q 1, Q 2, Q 3, different amounts of output. [FL] Now, let us me draw the iso cos line, in the long run what we have in the long run this is not a perfect graph, but do not worry about it what we want to capture we are able to capture here in this graph.

So, what we have here is in the long run we can vary both K and L what does isoquant mean even if we take this combination of K and L, we will be able to produce Q 1, but why we are choosing this combination. Because this combination is least costly combination to produce Q 1 amount of output that we have already learned ok. And similarly this is the least costly way to produce Q 2, and this is the least costly way to produce Q 3.

Here of course, what we are assuming we are moving here look at the amount of K and L, look at the amount of K and L we are able to change both K and L. So, the way we have described it of course, we are talking about cost minimization in the long run. Now let us look at it what happens in the short run? Short run what we have is the K is fixed let us say that K is fixed deliberately at this amount ok, this is the amount.

Now, if we want to produce Q 1 at the minimum possible cost which combination should we use we should use this particular combination. If you want to produce Q 2, we should use this combination and if you want to produce Q 3, we should use this combination fine. So, one thing you should figure out that the minimum cost to produce Q in the long run is going to be less than or equal to the minimum cost of producing Q in the short run.

Why you said it is fine I am saying to we are talking about producing Q 1, in short run as well as in long run ok. The minimum cost to produce Q 1 in long run is going to be less than or equal to the minimum cost of producing the same amount of output in the short run.

Student: Sir because in short run the capital is fixed and we can only vary labor. So, by looking at this I iso isoquant we can say that the minimum cost bundle is below it or ok.

You are using graph simple way to look at it very simple way to look at it in long run you are not allowed to vary K you are allowed to vary only L ok. K is fixed and in long run you can vary K and L both. So, in the long run the cost to produce Q the minimum cost to produce Q is of course, equal to or less than because you know at worst what you can do you can keep the K fixed.

Here in the long run you have more flexibility you can change K as well as L or L as well as K, while in the short run you are not allowed to change K. So, the cost in the long run minimum cost to produce Q in the long run is cannot be more than the minimum cost to produce Q in the short run, because in the long run, you are allowed to vary both K as well as L. Let us say you feel that you would be able to do worse by varying K in the long run, what you will do you will keep the K fixed same as the short run.

So, you will get the minimum cost as the short run, but maybe you can do better by changing K also in that case doing better what does it mean that you are able to reduce the cost. So, long run cost to produce Q minimum cost is going to be less than or equal to why I am saying equal to because look at this scenario. We have fixed K equal to K bar, of course here at the optimal level even though I am not allowed to vary K bar at optimal level is turns out that K star that is the K required in the long run is same as K bar.

So, in this case you cannot do better so the cost is going to be same in the long run as well as in the short run is it clear fine. Any doubt about it? Now, you can say that you can

say let us look at the graph also let me draw the same graph fine. Now, let us look at it in the long run you are producing here, and in the short run you have to use this combination. What would be the cost here minimum cost you are using this much amount of labor, and this much amount of capital this much amount of capital.

So, cost is going to be let us say it let me put L star, and K star, cost is going to be r K star plus w L star and I can draw a line r K plus W L giving the cost iso cost line and how would it look like exactly as blue line. Now, if we draw the iso cost line from here how would it look like parallel because r and K are fixed.

Student: Yes sir.

But K and L are different so it is going to be look like this. So, it would be parallel these two are these two are parallel you can say. So, see here of course, this indicates less cost then this, how about at this point it would be same as the.

Student: Blue line.

Blue line overlapping, so in this case long run cost, here is the same as short run cost fine.