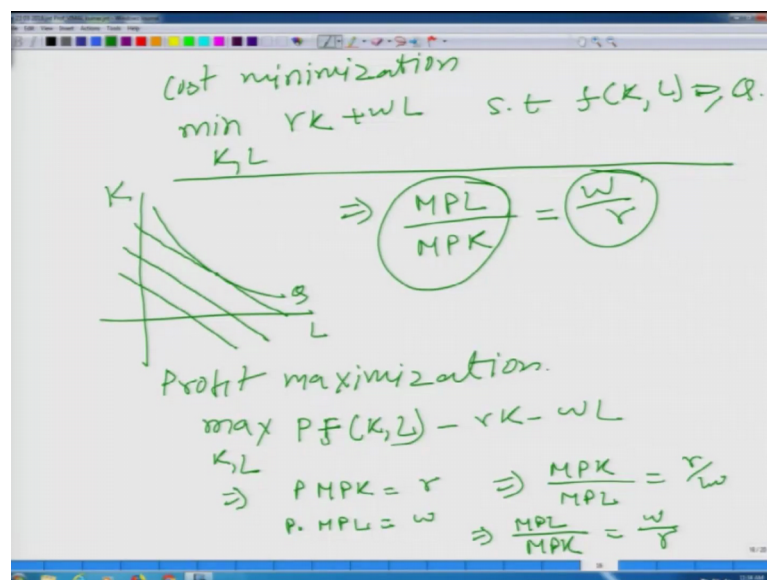


An Introduction to Microeconomics
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Lecture – 118
Profit maximization implies cost minimization

Ok so we have learnt about cost minimization and we have learnt about profit maximization in perfectly competitive market. What I want to show you that in perfectly competitive market profit maximization implies cost minimization.

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So, let us write the cost minimization problem first. The cost minimization problem is basically minimize rK plus wL with respect to K and L such that; that output is greater than or equal to Q the point that should be noted that the cost minimization does not depend on the price of the output in the market ok. So, we have already learnt that the cost minimization we draw the iso cost lines this is iso quant Q and this gives us condition that for maximization marginal product of labor divided or marginal product of capital has to be equal to W by r ok. W by r is the slope of iso cost line MPL by MPK is the slope of iso quant. And where the minimization happens at that point these 2 should be equal.

Now, let us look at the profit maximization the profit maximization. Problem is that maximize Pf of K comma L minus rK minus wL . And the first order conditions that we

get that $PMPK$ has to equal to r and P multiplied by marginal product of labor has to be equal to w . From here we can obtain that MPK divided by MPL has to be equal to r by w and this can be rewritten as MPL divided by MPK has to be equal to w by r . If you pay attention to this equation which is the condition for profit maximization, and this condition which is the condition for cost minimization these 2 conditions are the same.

So, we can say that profit maximization implies cost minimization. 2 things that we want to repeat one that if you pay attention to this part, this part is what? If we take it in the bracket we have to put a plus sign here. This rK plus wL is the cost, when you want to do the profit maximization you are doing the 2 things of course, one is Mr is equal to Mc marginal revenue is equal to marginal cost. And the second is to produce the Q amount of output from Mr is equal to Mc you get how much to produce because this would give you the label at which Mr is equal to Mc and once you have that label.

Basically, what you are doing? To produce that amount Q by in a least cost manner and this is what the minimization is doing. So, profit maximization in itself encapsulate the cost minimization ok. That is, the reason that we get these 2 condition are the same. Can we say that cost minimization implies profit maximization? Unfortunately, we cannot say that for a simple reason that if you the although the conditions are the same, but in this condition, we do not find any output price ok.

So, these 2 conditions can be reduced into the cost minimization condition, but from the cost minimization condition we cannot generate these 2 conditions. So, we can simply say that profit maximization implies cost minimization, but cost minimization does not necessarily imply profit maximization.

Thank you.