University of the People

ECON 1580 Introduction to Economics

Unit 3 Written Assignment 3

Liang Xiao

# Optimal Input Mix – Capital and Labor Decision

In determining how to allocate resources efficiently, firms analyze the marginal productivity of each input in relation to its cost. The marginal product of an input indicates the additional output generated by using one more unit of that input, while the input price represents the cost of utilizing that resource.

In this scenario, the firm faces the following data:  
- Marginal Product of Capital (MPK): 60  
- Price of Capital (PK): $6  
- Marginal Product of Labor (MPL): 20  
- Price of Labor (PL): $2.50

To assess input efficiency, the firm compares the marginal product per dollar for each input:

MPK / PK = 60 / 6 = 10

MPL / PL = 20 / 2.50 = 8

Since capital yields more output per dollar spent than labor does (10 vs. 8), the firm is not currently minimizing cost. To optimize its resource allocation and move toward productive efficiency, the firm should increase its use of capital and decrease its use of labor.

As the firm reallocates resources:  
- The marginal product of capital will decrease (due to diminishing returns).  
- The marginal product of labor will increase (as less labor is used).

This adjustment continues until the marginal product per dollar is equalized:

MPK / PK = MPL / PL

This point represents cost-minimizing input use, allowing the firm to produce its desired output level at the lowest possible cost.

In conclusion, the firm should adjust by substituting capital for labor until the marginal return per dollar is the same for both inputs. This strategy ensures efficient production and enhances competitiveness in the long run.

# References

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