

My Notes for Managerial Economics Fall 2024

Andres Espinosa

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1.1 Production Function

Production function: The production function shows the relationship between different amounts of a firm's inputs and the maximum quantity of output it can produce with those inputs.

$$Q = f(X_1, X_2, \dots, X_n) \quad (1)$$

1.2 Returns to Scale

Constant Returns to Scale: A one percent increase in all inputs causes a one percent increase in output

$$Q = X_1 + X_2 \quad (2)$$

$$(1.01)X_1 + (1.01)X_2 = 1.01Q \quad (3)$$

Increasing Returns to Scale: A one percent increase in all inputs causes a greater than one percent increase in output.

$$Q = X_1 X_2 \quad (4)$$

$$(1.01)X_1(1.01)X_2 = 1.01^2 Q \quad (5)$$

Decreasing Returns to Scale: A one percent increase in all inputs causes a less than one percent increase in output.

$$Q = \sqrt{X_1 + X_2} \quad (6)$$

$$\sqrt{(1.01)X_1(1.01)X_2} = \sqrt{1.01}Q \quad (7)$$