Basic Tools of Economic Analysis and Optimization Techniques
Session Outline

Basic Tools of Economic Analysis and Optimization Techniques

- Derivatives of various functions
- Optimization techniques
- Constrained optimization
Constrained Optimization

The techniques used for achieving a target under constrained situations or conditions is called constrained optimization.

Source: Managerial Economics; D N Dwivedi, 7th Edition
Substitution Technique

Applied to the Problem of Profit Maximization and Cost Minimization

For Profit Maximization

- One of the variable is expressed in the terms of other variable and solve the constraint equation for obtaining value of one variable.
- The value obtained is substituted in the objective function, which is maximized and solved for obtaining value of the other variable.

Source: Managerial Economics; D N Dwivedi, 7th Edition
For Cost Minimization

1. The constrained equation is expressed in terms of any one of the two goods, the variables;
2. This equation obtained from step 1 is substituted in the objective function.

Source: Managerial Economics; D N Dwivedi, 7th Edition
Lagrangian Multiplier Method

Method of solving constrained optimization problems

- It involves
- Combining of objective function and the constrained equation
- Solving by using partial derivative method

Steps for Cost Minimization:

- The problem is converted into a Lagrangian function and the constrained equation is set equal to zero.
- The equation is then multiplied with $\lambda$ and the results is added to the objective function.

Source: Managerial Economics; D N Dwivedi, 7th Edition
Session Summary

- Optimization Technique involves technique of maximizing total revenue, techniques of optimizing output & minimizing average cost & maximization of profit function

- Functional Relationship between Economic Variables states the relationship between a quantity, a value or a rate that changes according to the changes in their determinants
Session Summary

- Slope is the rate of change in the dependent variable as a result of changes in the independent variables.

- The techniques used for maximizing output under constrained situations is called constrained optimization.

- Constrained optimization uses substitution technique and Lagrangian multiplier method.
Session References

Managerial Economics; D N Dwivedi, 7th Edition