Lecture No - 3 : Introduction to Managerial Economics
Session Outline

1. Marginal and Incremental analysis
2. Model of an economy
3. Basic Tools of Economic Analysis and Optimization Techniques
4. Marginal Analysis

- Concept of Marginality deals with a unit increase in cost/revenue/utility.
- Marginal Cost/revenue/utility is the change in the total cost/revenue/utility due to unit change in output.
4. Marginal Analysis

- Marginal cost/revenue/utility is the total cost/utility/revenue of the last unit of output.
- \( MC_n = T_{Cn} - T_{Cn-1} \), Where \( n \) is the number of units of output.
4. Marginal Analysis

- Profits = Revenue – Costs
- Change in total revenue arising from a unit change in the output (Q): $MR = \frac{dTR}{dQ}$
- Slope (calculus derivative) of the total revenue curve
- Change in total costs arising from a unit change in the output (Q): $MC = \frac{dTC}{dQ}$
- Slope (calculus derivative) of the total cost curve
### 4. Marginal Analysis - Example

<table>
<thead>
<tr>
<th>No. of Unit</th>
<th>A: Total Revenue</th>
<th>Marginal Revenue</th>
<th>B: Total Cost</th>
<th>Marginal Cost</th>
<th>A-B: Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20000</td>
<td>-</td>
<td>4000</td>
<td>-</td>
<td>16000</td>
</tr>
<tr>
<td>2</td>
<td>34000</td>
<td>14000</td>
<td>8000</td>
<td>4000</td>
<td>26000</td>
</tr>
<tr>
<td>3</td>
<td>42000</td>
<td>8000</td>
<td>12000</td>
<td>4000</td>
<td>30000 (desired activity level)</td>
</tr>
<tr>
<td>4</td>
<td>46000</td>
<td>4000</td>
<td>16000</td>
<td>4000</td>
<td>30000 (absolute activity level)</td>
</tr>
<tr>
<td>5</td>
<td>48000</td>
<td>2000</td>
<td>20000</td>
<td>4000</td>
<td>28000</td>
</tr>
<tr>
<td>6</td>
<td>49000</td>
<td>1000</td>
<td>24000</td>
<td>4000</td>
<td>25000</td>
</tr>
</tbody>
</table>
4. Marginal Principle

To maximize profit, output should be increased up to the point where $MR = MC$

$MR > MC$ means the last unit of the output increased revenue more than it increased costs

$MR < MC$ means the last unit of the output increased costs more than it increased revenue
4. Incremental Analysis

In reality variables may not be subject to unit change always.

Incremental concept is applied when the change is not necessarily in term of single unit, but in bulk.
4. Incremental Analysis

- Estimates the impact of decision alternatives.
- **Incremental cost**: as the change in total cost as a result of change in the level of output, investment etc.
- **Incremental revenue**: as the change in total revenue resulting from a change in the level of output, prices etc.
- Manager always determines the worth of a decision on the basis of the criterion that IR>IC.
4. Incremental Analysis

Example

- An increase in the sales of firms due to introduction of online selling – Incremental Revenue (IR)
- Cost of launching the online selling mechanism – Incremental Cost (IC)
- If IR > IC – Decision of introducing online mechanism is right.
4. Marginal vs. Incremental Analysis

- Marginal relates to one unit of output.
- Incremental relates to one managerial decision - Multiple units of output is possible.
Model of an Economy: Real Flows and Money Flows (opposite direction to each other)

- **Factor market** (sale & purchase of input) **Product market** (sale & purchase of goods/services)

- **Factor Flows** (labour, capital)
- **Factor Income** (Wage, interest)
- **Product Flows** (Goods, services)
- **Payments** for products
- **Transfer Payments**
- **Taxes & Fees**

**Factor Market**
- **Determination of Factor Price**

**Product Market**
- **Determination of Product Price**

**Households**
- **Wages & Salaries**
- **Taxes & Fees**
- **Transfer Payments**

**Government Sector**
- **Payments for Purchases**
- **Taxes & Fees**
- **Transfer Payments**

**Business Firms**
- **Product Flows** (Goods, services)
- **Receivables** from products
- **Transfer Payments**
- **Taxes & Fees**

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Session References

Managerial economics – Christopher R Thomas, S Charles Maurice and Sumit Sarkar
Managerial economics – Geetika, Piyali Ghosh and Purba Roy Choudhury
Managerial economics- Paul G Keat, Philip K Y Young and Sreejata Banerjee
Micro Economics : ICFAI University Press
Basic Tools of Economic Analysis and Optimization Techniques
Learning Objectives

Functional relationship between the economic variables
Some important economic functions
Slope and its use in economic analysis
Derivatives of various functions
Optimization techniques
Constrained optimization
Functional relationship between the economic variables

**Economic variables**: Any economic Quantity, value or rate that varies on its own or due to change in its determinants is an economic variable.

Examples: Demand for product, produce Price. Wage rate, advertising expenditure.
Functional relationship between the economic variables

Economic variables are interrelated and interdependent.

Implies that a change in one variable causes a change in the value of other related variables.

Example: Price and quantity of a product, Income and consumption expenditure, interest rate and demand for funds etc.
Kinds of Economic Variables

Variables are classified on the basis of economic variables.

Dependent variables: The value of these variables depend on the value of other variables.

Independent variables: The value of these variables changes on their own or due to some exogenous factors.
Kinds of Economic Variables

Dependent and Independent Variable

Computer price and Demand for Computers
Petrol Price and Import Oil Price
Kinds of Economic Variables

**Endogenous variables:** The value of these variables is determined within the framework of the analysis model.

**Exogenous variables:** The value of these variables is determined outside the framework of the analysis model.
Kinds of Economic Variables

Endogenous and Exogenous variables

Petrol Price Example – Domestic Oil Price is endogenous and international oil price is exogenous variable.
Presentation of Relationship between Variables

Cause-and-Effect Relationship

Q_D = a - bP

Price | Demand | Supply
--- | --- | ---
1 | 10 | 2
2 | 8 | 4
3 | 6 | 6
4 | 4 | 8

Source: Managerial Economics; D N Dwivedi, 7th Edition
Tabular and Graphical form is useful only when number of variables and observations are small.

Most economic problems are complex and involves a large number of variables.

In such cases, economists uses a mathematical tools ‘function’ to express the relationship between the economic variables.
The Function

• It is a mathematical tool used for expressing the relationship between economic variables that have a cause-and-effect relationship.
• Bi-variable function: Involves only two variables
• Multi-variable function: One dependent and more than one independent variables.
The Function

An example can be stated if the value of variable $X$ depends on the value of variable $Y$, then the relationship between the two is:

$Y = f(X)$ where, $Y$ is the function of $X$.

$D_p = f(P) – Bi-Variate Demand Function$

$D_p = F(\ P, \ Y, A, \ T) – Multivariate Demand Function$
Specification of a function

• The nature of relationship

• The quantitative measures of relationship or the degree of relationship
Specification of a function

Use of Regression techniques for specification and quantification

\[ D = 500 - 5P \]

- At zero price, demand is equal to 500 units.
- (-) shows inverse relationship between price and demand.
- (5) Implies that for each one rupees change in price, demand changes by 5 units.
General form of Demand Function

\[ Q_x = a - bP_x \]

a and b are constant.

Constant in a function are called the parameters of the function.
Parameters of the function specify the extent of relationship between the dependent and independent variables.
General form of Demand Function

\[ Q_x = a - bP_x \]

- \( a \) gives the limit of \( Q_x \) when \( P_x = 0 \)
- \( b \) is the coefficient of variables \( P_x \) \( \rightarrow \) \( b \) measures the change in \( Q_x \) as a result of change in \( P_x \).
- \( \Delta Q_x = -b \cdot \Delta P_x \)
Session References

Managerial Economics; D N Dwivedi, 7th Edition