The Nature and Scope of Managerial Economics
Managerial Economics

- Managerial economics, meaning the application of economic methods in the managerial decision-making process, and it is a fundamental part of any business.
This is happening for several reasons

It is becoming more important for managers to make good decisions and to justify them, as their accountability either to management or to shareholders increases.

Number and size of multinationals increases, the costs and benefits at stake in the decision-making process are also increasing.

In the age of plentiful data it is more imperative to use quantitative and rationally based methods, rather than ‘intuition’.
The pace of technological development is increasing with the impact of the ‘new economy’. There is an increased need for economic analysis because of the greater uncertainty and the need to evaluate it.

Improved technology has also made it possible to develop more sophisticated methods of data analysis involving statistical techniques. Modern computers are adept at ‘number-crunching’, and this is a considerable aid to decision-making that was not available to most firms until recent years.
What is Managerial Economics???

It is the integration of economic principles with business management practices.

It is essentially *applied economics* in the field of business management.
Definitions: Managerial Economics

• Integration of Economic theory with business practice for purpose of facilitating decision making and forward planning by management
  - Spencer & Siegelman

• It is concerned with the application of economic concepts and economics to the problems of formulating rational decision making
  - Mansfield
Why do Managers need to know Economics?

• Economic theories contribute in building analytical models, which help to recognize the structure of managerial problems

• Economic theories do enhance analytical capabilities of business analyst

• They offer clarity to various concepts used in business analysis, which enables the managers to avoid conceptual pitfalls
Decision Problems faced by firms

- What should be the price of the product?
- What should be the size of the plant to be installed?
- How many workers should be employed?
- What is the optimal level of inventories of finished products, raw material, spare parts, etc.?
- What should be the cost structure?
Relationship between Economics & Management

- Economics theory
- Business Management
  - Decision Problems
- Managerial Economics - Application of Economics to solving business problems
- Optimal Solutions to Business problems
Significance: Managerial Economics

- Reconciling traditional theoretical concepts in relation to the actual business behavior and conditions
- Estimating economic relationships
- Predicting relevant economic quantities
- Formulating business policies and plans
Characteristics: Managerial Economics

- Microeconomic in character
- Is Normative rather than positive in character
- It is prescriptive rather than descriptive
- Also uses Macroeconomics since it provides an intelligent understanding of environment
Scope: Managerial Economics

• Incorporate micro and macroeconomics to deal with business problems

  ➢ **Microeconomics** - micro means a small part Concerned with analysis of behavior of individual economic variables such as individual consumer or a producer or price of a particular commodity

  ➢ **Macroeconomics** - concerned with aggregate behavior of the economy as a whole
The Firm Environment

- Society
- Suppliers
- Investors
- Management
- Employees
- Customers
Chief Characteristics

• Micro economics in character.
• Uses eco. concepts like “Theory of the Firm” and “Profit Theory”.
• Avoids abstract issues of eco. Theory but involves complications.
• It is perspective than descriptive eg. Law of demand states that as price increases demand goes down but is it good or bad.
### Difference

<table>
<thead>
<tr>
<th>Managerial Economics</th>
<th>Economics</th>
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<tbody>
<tr>
<td>Involves application of economic principles to problems of the firm.</td>
<td>Economics deals with the body of the principles itself.</td>
</tr>
<tr>
<td>Scope is not wide</td>
<td>Scope is wider</td>
</tr>
<tr>
<td>Micro in character</td>
<td>Both micro and macro</td>
</tr>
<tr>
<td>Deals only with the firm and not with individual’s economic problem</td>
<td>Deals with both</td>
</tr>
<tr>
<td>Modifies models and enlarges them</td>
<td>Simplifies models</td>
</tr>
<tr>
<td>More complex, introduces certain feedbacks</td>
<td>Simple, makes assumptions</td>
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Subject matter of Managerial Economics

• Demand Analysis and Forecasting—various factors influencing the demand for a firm’s product

• Cost Analysis—uncertain and uncontrollable

• Production and Supply Analysis—deals with different production functions and their managerial use - supply of commodities

• Pricing decisions, policies and practices—price is the genesis of the revenue of the firm

• Profit Management—profit is the chief measure of success

• Capital Management—management-large sum of money is involved- matter for top level decision
Management Eco. And other Subjects

Managerial Eco

- Operation Research
- Statistics
- Accounting
- Mathematics
Managerial Economics
Is a Tool for Improving
Management Decision
Making
Value Maximization Is a Complex Process
Microeconomics applied to (operational) internal issues

- Demand Analysis
- Production and Supply analysis
- Cost analysis
- Analysis of market structure and Pricing Theory
- Profit Analysis
- Capital and Investment Decisions
Macroeconomics applied to external issues:

Economic Environment

- Type of Economic system of a country
- Study of Macro variables
- Study related to foreign trade
- Study of Government policies – Monetary, Fiscal
Role of a Managerial Economist

• He is an economic advisor to a firm
• He not only studies the economic trends at macro level but also interpret their relevance to the particular industry
• Task of making specific decisions
• General task of managers to use readily available information in outside environment to make a decision that furthers the goals of organization
Decisions to be taken by Managerial economist

- Production scheduling
- Demand Estimation and Forecasting
- Analysis of market to determine nature and extent of competition
- Pricing problems of industry
- Assist business planning process
- Advising on investment and capital budgeting
- Analyzing and forecasting environmental factors
Basic Economic Principles for Managerial Decision making

• Opportunity Cost Principle
• Marginal Principle
• Incremental Principle
• Equi - Marginal Principle
• Time Perspective Principle
• Discounting Principle
Opportunity Cost

• Related to alternative uses of scarce resources
• Opportunity cost of availing an opportunity is the expected income foregone from second best alternative
• Difference between actual earning and its opportunity cost is called economic gain.
Marginal Principle

• Refers to change (increase or decrease) in total of any quantity due to a unit change in its determinant.

• $MC = TC_n - TC_{n-1}$

• $MR = TR_n - TR_{n-1}$

• Decision Rule FOR Profit Maximization: $MR = MC$
Marginal value

The marginal value of a dependent variable is the change in this dependent variable associated with a 1-unit change in a particular independent variable.
Limitations of Marginalism

• When used in cost analysis MC refers to change in variable cost only

• Generally firms do not have knowledge of MC & MR cos most firms produce in and sell their products in bulk except cases such as airplanes, ships, etc
Incremental Principle

• Applied to business decisions which involve a large change in total cost or total revenue

• *Incremental cost* can be defined as the change in total cost due to a particular business decision i.e change in level of output, investment, etc.

• Includes both fixed & variable cost but does not include cost already incurred i.e sunk cost
Contd.. Incremental Principle

• Incremental revenue is a change in total revenue resulting from a change in level of output, price etc

• A *business decision worthwhileness is always determined on the basis of criterion that incremental revenue should exceed incremental cost*
Equi - Marginal Principle

• Deals with allocation of resources among alternative activities

• According to this principle an input should be employed in different activities in such proportion that the value added by last unit is the same in all activities or marginal products from various activities are equalized.

• $MP_A = MP_B = MP_C = \ldots MP_N$
Time Perspective Principle

• Short run & Long run time periods play an important role in Business decisions

• Short run mean that period within which some of inputs cannot be altered (fixed inputs). However in long run all inputs can be altered so they are variable in long run

• Determination of time perspective is of great significance where projections are involved
Discounting Principle

• A rupee now is worth more than a rupee earned a year after

• To take decision regarding investment which will yield return over a period of time it is necessary to find its present worth by using discounting principle

• This principle helps to bring value of future rupees to present rupees
  • PV=1/1+i i=8%
  • PV=100/1.08=92.59
Variables and Functions

• By definition, any economic quantity, value or rate that varies on its own or due to a change in its determinant(s) is an economic variable.
Functions

• A function is a mathematical technique of stating the relationship between any two variables having cause and effect relationship
  – *When a relation is established between two or more variables, it is said that they are functionally related*
  – When two variables are involved it is **bi-variate** and more than two it is **Multi-variate**
Functions

• Of the two one is independent variable which may change on its own independently and other is dependent which changes in relation to changes in the assigned independent variable in a given function

• In mathematical terms, $Y = f(X)$
How Is Managerial Economics Useful?

• Evaluating Choice Alternatives
  – Identify ways to efficiently achieve goals.
  – Specify pricing and production strategies.
  – Spell out production and marketing rules to maximize profits.

• Making the Best Decision
  – Managerial economics helps meet management objectives efficiently.
  – Managerial economics shows the logic of consumer, and government decisions.
Managerial Decision Problems

• Product Price and Output
• Make or Buy
• Production Technique
• Inventory Level
• Advertising Media and Intensity
• Labor Hiring and Training
• Investment and Financing
The Managerial Decision-Making Process

• Managerial Economics – applies economic theory and methods to business and administrative decision making.

• Specifically managerial economics
  – prescribes rules for improving managerial decisions.
  – indicates how one can achieve organizational objectives efficiently
  – allows one to recognize how economic forces affect organizations
  – describes the economic consequences of managerial behavior.
Theory of the Firm
The Theory of the Firm
Production Function

Inputs

Land
Labour
Capital

Process

Product or service generated - value added

Output
Objectives of the firm

- Objectives are targets or goals that a business sets itself.
- The theory of the firm is based on the assumption that all businesses will operate to make a profit.
- Businesses face upward sloping total cost and revenue curves – as more is produced costs increase and as more is sold revenue increases.
Marginal costs and marginal benefits

- The point of profit maximisation is where the difference between Total revenue and total costs is greatest
Additional Objectives

• There are additional objectives that a business could pursue including:
  – Growth
  – Sales revenue maximisation
  – Limit pricing to gain monopoly power
  – Customer satisfaction

• The satisficing principal sets a minimum acceptable level of achievement
Divorce of Ownership and Control

• Divorce of ownership and control is where the people that own the business (the shareholders) are not the same as the people that control the business (the board of directors)

• Where there is a divorce of ownership and control businesses may not pursue profit maximisation as the managers may have different objectives to the owners
Law of Diminishing Returns and Returns To Scale

• The law of diminishing returns says that as we add more units of a variable output to factors of production then output will initially rise and then fall.

• Diminishing returns occur when marginal revenue starts to fall as each extra worker is adding less to total revenue.
Diminishing returns and productivity

- Diminishing returns occur as the productivity of extra workers decreases over time.
- When output is low other factors of production tend to be under utilised so each worker is able to use the other factors more efficiently increasing productivity.
- When production reaches a certain level the factors of production are less plentiful and therefore each worker adds less to productivity.
Law of diminishing returns and costs

- Law of diminishing returns can also be called the law of increasing opportunity cost
- There is an inverse relationship between returns of inputs and the cost of production
- Costs per unit of output will therefore start to rise at a certain point
Productivity and factor prices + Production and factor choices

- The productivity of different factors of production will influence the businesses choice of factor inputs.
- Factor prices will also influence the choice of inputs – if some factors are more expensive than others it is likely that the business will choose these over more expensive factors.
Costs

• Costs – what a business pays out
• Fixed costs – these do not alter with output
• Variable costs – alter directly with the business’s level of output
• Total costs – are fixed and variable costs added together
• Semi variable – have a fixed and a variable element
Fixed Costs

• Examples – rent, management salaries, rates
• Graphically fixed costs will always be illustrated by a horizontal line
• As output changes fixed costs stay the same
Variable costs

- Examples – fuel, raw materials
- Graphically variable costs will always be a diagonal line from the origin
- As output changes variable altered directly
Total Costs

• Managers use these figures to make decisions on level of output and prices
Average Costs

- Average costs are total costs divided by the quantity produced
- ATC / AC = TC / quantity
- Average fixed costs fall when output increases as the fixed costs are spread over more units
- AFC = FC / quantity
Short run costs

- In the short run consider fixed and variable costs
- Average total cost line is U-shaped as when diminishing returns start to kick in the average total cost per unit increases
Marginal costs

• Marginal costs relate to variable costs
• Marginal costs are the amount each additional unit adds to costs
• Marginal costs per unit decrease as production increases until they meet a critical level when they start to increase
Short Run Costs
Long Run Costs

• In the long run all factors of production can be varied so fixed and variable costs can alter
Economies of Scale

- These occur when mass producing a good results in lower average cost.
- Average costs fall per unit – Average costs per unit = total costs / quantity produced
- Economies of scale occur within an firm (internal) or within an industry (external).
Internal and External Economies

• Internal Economies of Scale
  As a business grows in scale, its costs will fall due to internal economies of scale. An ability to produce units of output more cheaply.

• External Economies of Scale
  Are those shared by a number of businesses in the same industry in a particular area.
<table>
<thead>
<tr>
<th>Types of internal economy of scale</th>
<th>Example</th>
</tr>
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</table>
| Production / Technical Economies  | • Larger firms can use computers / technology to replace workers on a production line  
• Mass production lowers cost per unit  
• Large scale producers can employ techniques that are unable to be used by a small scale producer.  
• Able to transport bulk materials. |
| Purchasing / Marketing Economies  | • Advertising costs can be spread across products  
• Large businesses can employ specialist staff  
• Bulk buying – if you buy more unit cost falls |
| Financial Economies               | • Larger firms have better lending terms and lower rates of interest  
• Easier for large firms to raise capital.  
• Risk is spread over more products.  
• Greater potential finance from retained profits.  
• Administration costs can be divided amongst more products |
| Managerial Economies              | • More specialised management can be employed, this increases the efficiency of the business decreasing the costs |
| Risk-bearing Economies            | • Large firms are more likely to take risks with new products as they have more products to spread the risk over |
External Economies of Scale

• These are advantages gained for the whole industry, not just for individual businesses.
Examples of External Economies

• As businesses grow within an area, specialist skills begin to develop.
• Skilled labour in the area – local colleges may begin to run specialist courses.
• Being close to other similar businesses who can work together with each other.
• Having specialist supplies and support services nearby.
• Reputation
Diseconomies of Scale

• Occur when firms become too large or inefficient
• Average costs per unit start to rise
<table>
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<tr>
<th>Types of diseconomy of scale</th>
<th>Example</th>
</tr>
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</table>
| **Communication**            | • When firms grow there can be problems with communication  
                                • As the number of people in the firm increases it is hard to get the messages to the right people at the right time  
                                • In larger businesses it is often difficult for all staff to know what is happening |
| **Coordination and control problems** | • As a business grows control of activities gets harder  
                                • As the firm gets bigger and new parts of the business are set up it is increasingly likely people will be working in different ways and this leads to problems with monitoring |
| **Motivation**               | • As businesses grow it is harder to make everyone feel as though they belong  
                                • Less contact between senior managers and employees so employees can feel less involved  
                                • Smaller businesses often have a better team environment which is lost when they grow |
Economies of Scale and Monopolies

• Economies of scale can lead to the development of monopolies as larger businesses are able to exploit lower unit costs and therefore make more profits
Economies of Scale

• Minimum efficient scale – where an increase in the scale of production gives no benefits to a reduction in unit costs

• Minimum efficient plant size – where an increase in the scale of production of an individual plant within the industry doesn’t result in any unit cost benefits
Minimum Efficient Scale

• This is the point where production is sufficient for internal economies of scale to be fully exploited
• Minimum efficient scale is seen as the lowest point on the long run average cost curve
• The MES depends on a number of factors including:
  – Ratio of fixed to variable costs
  – If a natural monopoly exists
Economies of Scale and Barriers to Entry

- Economies of scale can act as a barrier to entry for firms into a market
- This is because economies of scale allow a firm to have a lower cost structure and therefore can decrease prices if a new firm enters the market eventually driving them out
Technological Change, Costs and Supply in the Long run

- Invention, innovation and technology can impact a businesses by decreasing costs in the long run.
- Innovation, invention and technology can also impact a businesses method of production – for example causing the firm to move from labour intensive to capital intensive methods.
- These factors may also result in an increase in efficiency for the firm which can also result in cost savings.
Revenue

- Total Revenue = Quantity Sold x Average Selling Price
- Generally if it reduces its selling price you expect to sell more
- A rise in price usually leads to a fall in quantity sold
- Average revenue = Total revenue / output
- Marginal revenue = the amount each unit adds to total revenue
Revenue Curves

• Marginal revenue slopes downwards – as more is produced the increase in revenue gets smaller
• Because marginal revenue declines as production increases average revenue per unit also declines with increased production
Profit

- Profit is the payment for enterprise – the risks that are taken
- Normal profit – this is the amount of profit needed to keep all factors of production in their current use in the long run
- Normal profit is a minimum level that is needed for an entrepreneur to stay in that business
- Supernormal / abnormal profit – is any profits that exceed the normal amount
Profit

• Profits are maximised where there is the largest difference between MR and MC
• Profits have a number of roles in an economy:
  – Supernormal or rising profits attract new entrants to markets
  – Retained profits provide finance for future investments
  – Allocation of factors of production - scarce factors tend to be more expensive and will therefore be used where they are likely to be the most profitable
Basic Cost-Management Concepts
Basic Definitions

• A cost is incurred when a firm uses a resource for some purpose

• Costs are assembled into meaningful groups called cost pools (e.g., by type of cost or source)

• Any factor that has the effect of changing the level of total cost is called a cost driver

• A cost object is any product, service, customer, activity, or organizational unit to which costs are assigned for some management purpose
There are four main ways to classify costs ("different costs for different purposes"):

– For product and service costing (GAAP)
– For strategic decision-making (cost-driver analysis)
– For planning and decision-making
– For control/feedback
The process of assigning costs to cost pools or from cost pools to cost objects

– *Direct costs* can be conveniently and economically traced to a cost pool or a cost object

– *Indirect costs* cannot be traced conveniently or economically to a cost pool or a cost object

– Because indirect costs cannot be traced, assignment is made through the use of cost drivers (*cost allocation*)
• **Product costs** include only the costs necessary to complete the product at the manufacturing step in the value chain (manufacturing) or to purchase and transport the product to the location of sale (merchandising)

• **Period costs** include all other costs incurred by the firm in managing or selling the product (indirect costs outside the manufacturing step of the value chain)
Cost Information for Short-term Planning: Classification by Behavior

• What is meant by “cost behavior”?
• Common classifications of cost behavior:
  – *Fixed (capacity) cost* is the portion of total cost that does not change with changes in output
  – *Variable cost* is the change in total cost associated with each change in quantity of the cost driver
  – *Mixed cost* is used to refer to a total cost figure that includes both a fixed and variable component
Variable Costs

<table>
<thead>
<tr>
<th>Units of the Cost Driver</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>3,500</td>
<td>$3,000</td>
</tr>
<tr>
<td>3,600</td>
<td>$3,500</td>
</tr>
</tbody>
</table>

Total Variable Cost

Total Cost
Short-Run Decision-Making Cost Concepts

• **Relevance** is the most important characteristic for information used in decision making
  – Relevant costs have two properties: they *differ* for each decision option and they will be incurred in the *future*

• **Opportunity cost** is the benefit lost when choosing one option precludes receiving the benefits from the alternative option

• **Sunk costs** are costs that have been incurred or committed in the past and are therefore irrelevant in current decision making
Opportunity Cost

• The income that would have been received if the input had been used in its most profitable alternative use.

• The value of the product not produced because an input was used for another purpose.

• An “economic concept” not an “accounting concept.”
  – As economic decision-makers, we assume costs include opportunity costs.
If costs are linear, then total costs graphically look like this.

Total fixed costs do not change as the cost driver increases.

Higher total fixed costs are higher above the x axis.
Behavior of Total (Linear) Costs

If costs are linear, then total costs graphically look like this.

Total variable costs increase as the cost driver increases.

A steeper slope represents higher variable costs per unit of the cost driver.
Total Versus Per-unit (Average) Cost Behavior

If total variable costs look like this . . .

\[
\text{If total variable costs look like this} \ldots
\]

\[
\text{If total variable costs look like this} \ldots\text{then variable costs per unit look like this.}
\]
Total Versus Per-Unit (Average) Cost Behavior

If total fixed costs look like this . . .

. . . then fixed costs per unit look like this.
When costs are linear, the cost function is:

\[ TC = F + V \times Q, \]

where

- \( F \) = total fixed cost,
- \( V \) = variable cost per unit of the cost driver,
- \( Q \) = the quantity of the cost driver.

The intercept is the total fixed cost.

The slope is the variable cost per unit of the cost driver.

A cost that includes a fixed cost element and a variable cost element is known as a mixed cost.
Sometimes nonlinear costs exhibit linear cost behavior over a range of the cost driver. This is the **relevant range** of activity.

**Nonlinear Cost Behavior**

intercept = total fixed costs

slope = variable cost per unit of cost driver
Scatterplot

• A scatterplot shows cost observations plotted against levels of a possible cost driver.

• A scatterplot can assist in determining:
  • which cost driver might be the best for analyzing total costs, and
  • the cost behavior of the cost against the potential cost driver.
Which Cost Driver Has the Best Cause & Effect Relationship with Total Cost?

8 observations of total selling expenses plotted against 3 potential cost drivers:

- # units sold
- # customers
- # salespersons
Regression Analysis

• Regression analysis estimates the parameters for a linear relationship between a dependent variable and one or more independent (explanatory) variables.

• When there is only one independent variable, it is called simple regression.

• When there is more than one independent variable, it is called multiple regression.

\[ Y = \alpha + \beta X + \square \]

\( \alpha \) and \( \beta \) are the parameters; \( \square \) is the error term (or residual)
Regression Analysis Used to Estimate a Mixed Cost Function

We can use regression to separate the fixed and variable components of a mixed cost.

\[ Y_i = \alpha + \beta X_i + i \]

- \( Y_i \) is the actual total costs for data point \( i \)
- \( \beta \) term is the variable cost per unit
- \( \alpha \) term is total fixed costs
- \( X_i \) is the actual quantity of the cost driver for data point \( i \)
- \( i \) is the difference between the predicted total cost for \( X_i \) and the actual total cost for observation \( i \)
- the slope term is the variable cost per unit
Costs

- Total fixed costs (TFC)
- Average fixed costs (AFC)
- Total variable costs (TVC)
- Average variable cost (AVC)
- Total cost (TC)
- Average total cost (ATC)
- Marginal cost (MC)
Short-Run & Long-Run

• “Time concepts” rather than fixed periods.
• Short-run:
  – One or more production input is fixed:

• Long-run:
  – The quantity of all necessary production inputs can be changed.
  – Expand or acquire additional inputs.
Fixed Costs

• Result from owning a fixed input or resource.
• Incurred even if the resource isn’t used.
• Don’t change as the level of production changes (in the short run).
• Exist only in the short run.
• Not under the control of the manager in the short run.
• The only way to avoid fixed costs is to sell the item.
Fixed Costs

1. Depreciation
2. Interest
3. Rent
4. Taxes (property)
5. Insurance

- Cash
- Noncash
Important Fixed Costs

• Total fixed cost (TFC):
  – All costs associated with the fixed input.

• Average fixed cost per unit of output:

\[
AFC = \frac{TFC}{\text{Output}}
\]
Variable Costs

• Can be increased or decreased by the manager.
• Variable costs will increase as production increases.
• Total Variable cost (TVC) is the summation of the individual variable costs.
• \( VC = (\text{the quantity of the input}) \times (\text{the input’s price}) \).
Variable Costs

• Variable costs exist in the short-run and long-run:
  – In fact, all costs are considered to be variable costs in the long run.
Important Variable Costs

• Total variable cost (TVC):
  – All costs associated with the variable input.

• Average variable cost per unit of output:

\[
AVC = \frac{TVC}{\text{Output}}
\]
Total Cost

• The sum of total fixed costs and total variable costs:

\[ TC = TFC + TVC \]

• In the short run TC will only increase as TVC increases.
Average Total Cost

• Average total cost per unit of output:

\[
ATC = \frac{AFC + AVC}{Output}
\]
Marginal Cost

• The additional cost incurred from producing an additional unit of output:

\[
MC = \frac{\Delta TC}{\Delta Output} \\
MC = \frac{\Delta TVC}{\Delta Output}
\]
Typical Total Cost Curves

![Typical total cost curves.]
Typical Total Cost Curves (selected attributes)

• TFC is constant and unaffected by output level.

• TVC is always increasing:
  – First at a decreasing rate.
  – Then at an increasing rate.

• TC is parallel to TVC:
  – TC is higher than TVC by a distance equal to TFC.
Fixed Costs

1. Depreciation
2. Interest
3. Rent
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Typical Total Cost Curves
(selected attributes)

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Typical Average & Marginal Cost Curves

- Average total cost
- Marginal cost
- Average variable cost
- Average fixed cost
Typical Average & Marginal Cost Curves

- AFC is always declining at a decreasing rate.
- ATC and AVC decline at first, reach a minimum, then increase at higher levels of output.
- The difference between ATC and AVC is equal to AFC.

- MC is generally increasing.
- MC crosses ATC and AVC at their minimum point.
- If MC is below the average value:
  - Average value will be decreasing.
- If MC is above the average value:
  - Average value will be increasing.
Production Rules for the Short-Run

• If expected selling price > minimum ATC (which implies TR > TC):
  – A profit can be made.
• Maximize profit by producing where:
  \[ MR = MC \]
Production Rules for the Short-Run

• If expected selling price < minimum ATC
  • but > minimum AVC:
    (which implies TR > TVC but < TC)
    – A loss cannot be avoided.
    – Minimize loss by producing where
      – MR = MC.
    – The loss will be between 0 and TFC.
Production Rules for the Short-Run

• If expected selling price < minimum AVC (which implies TR < TVC):
  – A loss cannot be avoided.
  – Minimize loss by not producing.
  – The loss will be equal to TFC.
Short Run Production Decisions

Illustration of short-run production decisions.

- Marginal cost
- Average total cost
- Average variable cost

Dollars
- MR1
- MR2
- MR3

Output
Production Rules for the Long-Run

- If selling price > ATC (or TR > TC):
  - Continue to produce.
  - Maximize profit by producing where
    - MR = MC.
Production Rules for the Long-Run

• If selling price < ATC (or TR < TC):
  – There will be a continual loss.
  – Sell the fixed assets to eliminate fixed costs.
  – Reinvest money in a more profitable alternative.
Long-Run Average Cost Curve
(Economies of Size)
Long-Run Average Cost Curve
(Diseconomies of size)