

# HSS 201: Economics for Engineers

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# Costs in Information and Communication Technology

The revolution in information and communication technologies (ICT) has roots that go back to the nineteenth century, but it accelerated in the latter part of the twentieth century when a new general purpose built technology, the electronic computer and a few related technologies, began to transform much of the economic, social, and political structure of society.

The revolution has been associated with many new products, new production processes, and new forms of organization.

# Falling Cost Curves in ICT Industries

ICT firms are working with cost curves that decline over their whole range. However many ICT firms are working with cost curves that decline over their whole range.

Typically, there are very large fixed costs associated with the R&D and set up costs of creating a new technology in the ICT sector.

In contrast, MC of producing another unit of output are very small or virtually zero. As a result, the AC declines throughout its whole relevant range.

New entrants find it virtually impossible to break in to an industry where the established player is selling its product at very low marginal cost.

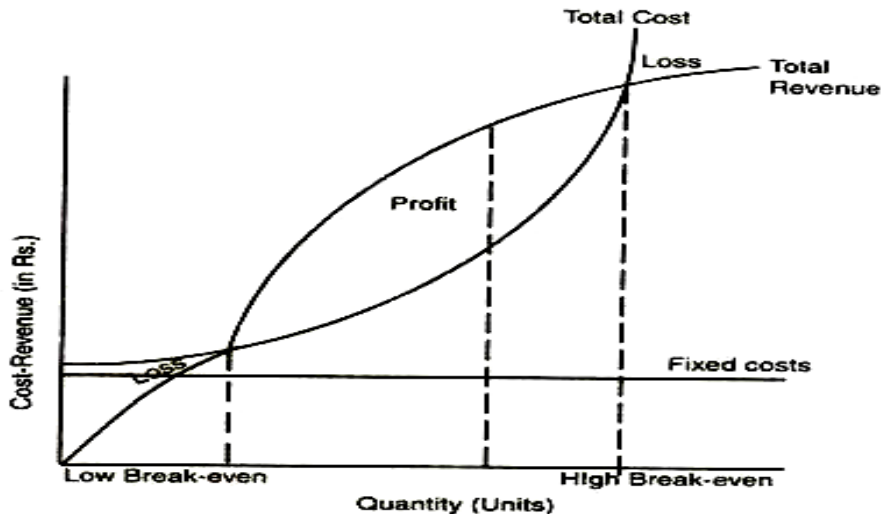
Example – Microsoft windows operating system, telephone lines, Optic fiber cables

# Comparison of Cost Across Industries

Where costs are rising, firms are competing at the margin - A small price change or quality initiative will take a bit of business at the margin from several main rivals.

However, constant or falling MC industries tend to have big jumps from one dominant player to another.

# Break-Even Analysis



# Break-Even Analysis

$$\pi = R(Q) - C(Q)$$

$$\text{F.O.C : } \frac{d\pi}{dQ} = 0$$

$$R'(Q) = C'(Q)$$

$$\text{S.O.C : } \frac{d^2\pi}{dQ^2} < 0$$

$$R''(Q) < C''(Q)$$

# Break-Even Analysis and Pricing Strategies

- ① Penetration Pricing: More sales to break even. High Sales, Low Price
- ② Market Skimming: Fewer sales to break even. Low Sales, High Price

# An Example to Break-Even

The price of a product is Rs. 150 and it sells 100 products. The fixed cost of production is Rs. 10000; while the per unit variable cost is Rs. 85. What would the firm earn as Total Revenue for it to break even?



# Concept of Margin

**Contribution Margin:** It is that portion of sales revenue that is not consumed by the variable cost. It is  $TR - TVC$ . Therefore, it contributes to the coverage of fixed cost.

**Margin of Safety:** It refers to the range of output over which a profit can be made. It can be identified on the break-even chart by measuring the distance between the break-even level of output and the current (profitable) level output.

# Investment Analysis

Investment is an activity of spending resources (money, labour, time) on creating assets that can generate income over a long period of time.

## Types of Investment

- 1 Investment in Financial Assets
- 2 Investment in Physical Assets
- 3 Investment in Human Capital
- 4 Miscellaneous Investment

# Capital Budgeting

The decision as to which projects should be undertaken by a corporation is known as the ‘investment decision’, and the process is known as ‘capital budgeting’.

Capital budgeting involves investment decisions balancing the sources and the uses of funds for acquiring fixed capital assets like machinery and equipment.

It covers the various issues like the decisions regarding the amount of money for capital investment, the source of financing and the allocation of the investment between projects over time.

# Process of Capital Budgeting

- 1 Investment Criterion: It involves decisions regarding both the amount of investment in the planning period and the selection of projects.

What decision? A few examples

- Expansion of production plant
  - Changing the existing production structure (abiding to the current environment standards)
  - Merger and Acquisition
- 2 Financing Investment: Decision for sources of capital
    - External Sources: Loans, Issue of Shares
    - Internal Sources: Retained Profits, Sale of Assets
  - 3 Allocation of funds among projects

# Why there is a need to Invest?

- 1 Technological Change - Efficiency Seeking
- 2 Competitors Strategy
- 3 Future Speculation about demand
- 4 Government Policies
- 5 Non-economic Factors

# Determining the Size of capital

- 1 The Open Ended Approach
- 2 The Fixed or Rationing Type of Budget
- 3 Case by Case Rationing Approach

# Steps in Capital Budgeting

- 1 Preparing Investment Proposal
- 2 Estimated Cash Flow for the Proposals
- 3 Knowledge about various Criterion Used for Project Evaluation