

**Study Guide: Key concepts
Economics 691
Managerial Economics
Notes**

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INTRODUCTION

I what is Managerial Economics?

- All resources are scarce.
- All decisions can be boiled down to how to allocate resources to best meet some objective.

II Managerial Economics' advice for decision making

A The Steps

- Managerial economics is proscriptive. It provides a scientific method for making business decisions.
- The method requires four general steps:
 1. Formulate the problem: list the objective and the possible decisions.
 2. Gather data on the objective and the decisions.
 3. Using statistics, estimate the relationship between the objective and the decisions, known as the objective function.
 4. Using calculus or game theory, choose the decision that maximizes the objective function.

B Example

C Alternative Methods of Making Decisions

- Alternative of relying on experience or guesswork is often almost as good.
- Both methods require common sense.

III Decisions Studied in Managerial Economics

1. How much to produce?
2. What inputs to use?
3. What price to charge?

IV Theory of the Firm

A Objective of the firm

- The objective of the firm is to maximize profits or the present value of the firm.
- Profits are economic profits.
- Individual managers may have other objectives.

B Economic Profits

- Economic profits are accounting profits less opportunity costs.
- Economic profits are useful for decision making, since they take into account other options. Accounting profits are good for detecting fraud, keeping records, etc.
- Positive economic profits attract competitors, negative economic profits cause firms to exit the industry to pursue other opportunities. Thus economic profits tend to zero.

C Other objectives

1 Objectives of firms and managers

- Most other stated goals of the firm are intermediate goals toward maximizing profits.
- Individual managers are motivated by incentives such as performance objectives and stock options.

2 Profit maximization, ethics, and welfare

Maximizing profits improves the welfare of society in two ways:

1. The firm provides products and services that consumers want (as evidenced by their willingness to pay for the products, and thus add to firm profits).
2. The firm stays in business, thus providing income to workers and stockholders.

Under specific conditions, maximizing profits maximizes welfare of society.

PRODUCTION THEORY

I The Production Function

Uses of the production function:

1. Set inputs to produce a specified quantity of outputs.
2. Determine the number of inputs needed to meet objective of maximizing production.
3. Determine the number of inputs needed to meet objective of maximizing productivity.
4. Determine the number of inputs needed to meet objective of maximizing profits.
5. Evaluate potential mergers, spin-offs, outsourcing, and determine the optimal factory size and number of factories.

Properties of the production function:

1. Zero inputs implies zero output.
2. Diminishing marginal product.
3. Positive marginal product.

II Application 1: Maximizing Production

A maximum occurs when the slope of the objective is zero, or when the derivative of the objective with respect to each decision is zero.

III Application 2: maximizing productivity

Skipped.

IV Application 3: Maximizing Profits

A Example

B Marginal Revenue Product

- Profits are maximized when marginal revenue product equals marginal expenditure.
- If an input generates more revenue for the firm than the input costs, then the manager can increase profits by purchasing the input.

V Multiple Inputs

A Marginal Product and Price Ratios

1. Profit maximization requires inputs to be used efficiently. Efficient use of inputs occurs when the ratio of marginal products equals the price ratio.
2. If we reduce the first input by one unit, and spend the cost savings on the second input, the second input increases by the price ratio.
3. If we reduce the first input by one unit, the marginal product ratio gives the number of additional units of the other input required to keep production constant.
4. Thus, if (b) is greater than (c), we can increase profits by reducing the first input by one unit, and either (1) adding enough of the second input to keep production constant and pocket the cost savings or (2) adding an amount of the second input equal to the price ratio to keep costs constant but increase production.

B Example: Multiple Inputs

VI Mergers and Spinoffs

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VII How Do We Find the Production Function?

A Obtain input-output data

Sources of data:

1. Time Series Data (easy to come by, difficult to compare output across years).
2. Cross Section Data (somewhat easy to come by, sometimes difficult to compare across factories).
3. Use technical information supplied by engineers (accurate but difficult to come by, especially in service industries).
4. Conduct a randomized study (accurate but very expensive and difficult to come by).
5. Benchmarking (Provides unique information but is difficult to come by).

B Choosing a production function

C Regression

Information provided by a regression:

1. Coefficients which make the production function “closest” to the real world data.
2. T-stat (does the input have any effect on output?).
3. R^2 (What percentage of the variation in output is explained by the production function?).

COST THEORY

I What costs matter?

A Opportunity Costs

The relevant cost for managerial decisions is the opportunity cost, or the value of the next best alternative.

B Fixed costs, variable costs, and sunk costs

Sunk costs are irrelevant for managerial decisions. Types of sunk costs:

1. Costs incurred in the past.
2. Fixed costs which cannot be recovered (eg. a signing bonus).
3. Costs which must be incurred but are unrelated to the number of units produced.

II Short run costs

Properties of Cost functions in the short run:

1. Total costs increase with total output.
2. Average fixed costs decline with total output as the fixed costs are spread over a larger number of units.
3. Marginal costs and average variable costs initially fall (workers become more specialized and efficient) and then rise with production (with capital fixed, diminishing returns to labor makes it difficult to raise production by just adding workers).
4. Thus average total costs initially fall and then rise because of (2) and (3).

III Examples of using Short run cost curves.

Uses of cost functions:

1. Choose a level of output to minimize costs and maximize profits (short run costs).

2. Conduct a break even analysis (short run costs).
3. Minimize average costs.
4. Make decisions regarding mergers, spin offs, expansion, and contraction of the size of the firm (long run costs).

IV Long Run Costs

In the long run, no costs are fixed. Long run average costs initially decline but may eventually decrease or increase.

Types of industries and long run costs.

1. Industries characterized by large fixed costs (cruise ships, telecommunications, etc.) are characterized by decreasing long run average costs.
2. Heavily taxed industries or countries which heavily tax large firms often have increasing long run average costs (street vendors in Peru).
3. Large firms face information problems about local markets and employees lack meaningful incentives.

If long run average costs are decreasing, industry consolidation reduces costs. If long run average costs are increasing, spin-offs and outsourcing are in order.