Managerial Economics & Business Strategy

Chapter 1

The Fundamentals of Managerial Economics

Overview

I. Introduction

II. The Economics of Effective Management

- Identify Goals and Constraints
- Recognize the Role of Profits
- Five Forces Model
- Understand Incentives
- Understand Markets
- Recognize the Time Value of Money
- Use Marginal Analysis

Managerial Economics

- Manager
  - A person who directs resources to achieve a stated goal.
- Economics
  - The science of making decisions in the presence of scare resources.
- Managerial Economics
  - The study of how to direct scarce resources in the way that most efficiently achieves a managerial goal.

Identify Goals and Constraints

- Sound decision making involves having well-defined *goals*.
  - Leads to making the “right” decisions.
- In striking to achieve a goal, we often face *constraints*.
  - Constraints are an artifact of scarcity.

Economic vs. Accounting Profits

- Accounting Profits
  - Total revenue (sales) minus dollar cost of producing goods or services.
  - Reported on the firm's income statement.
- Economic Profits
  - Total revenue minus total opportunity cost.

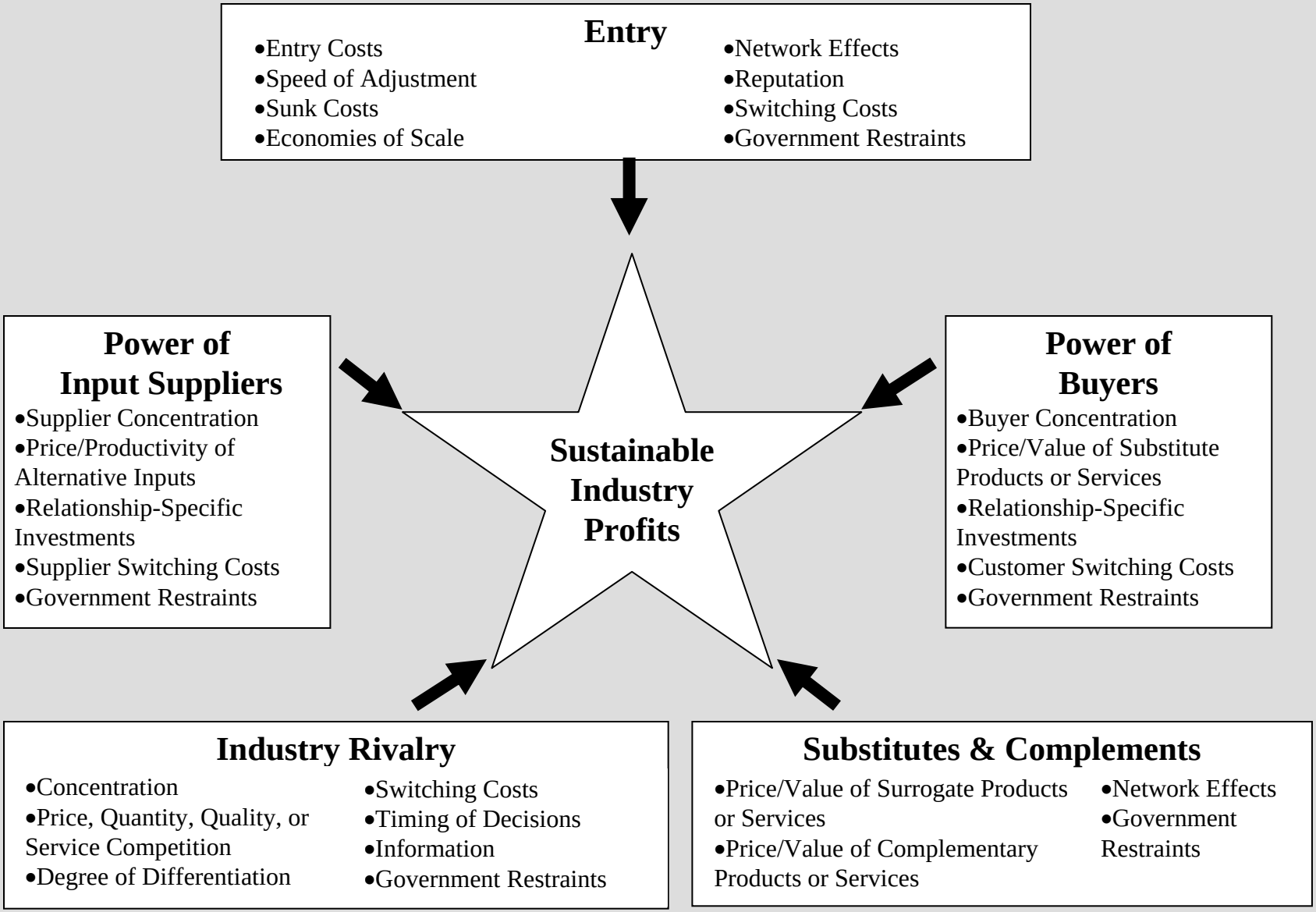
Opportunity Cost

- Accounting Costs
  - The explicit costs of the resources needed to produce produce goods or services.
  - Reported on the firm's income statement.
- Opportunity Cost
  - The cost of the explicit *and* implicit resources that are foregone when a decision is made.
- Economic Profits
  - Total revenue minus total opportunity cost.

Profits as a Signal

- Profits signal to resource holders where resources are most highly valued by society.
  - Resources will flow into industries that are most highly valued by society.

The Five Forces Framework



Understanding Firms' Incentives

- Incentives play an important role within the firm.
- Incentives determine:
  - How resources are utilized.
  - How hard individuals work.
- Managers must understand the role incentives play in the organization.
- Constructing proper incentives will enhance productivity and profitability.

Market Interactions

- Consumer-Producer Rivalry
  - Consumers attempt to locate low prices, while producers attempt to charge high prices.
- Consumer-Consumer Rivalry
  - Scarcity of goods reduces the negotiating power of consumers as they compete for the right to those goods.
- Producer-Producer Rivalry
  - Scarcity of consumers causes producers to compete with one another for the right to service customers.
- The Role of Government
  - Disciplines the market process.

The Time Value of Money

- Present value (*PV*) of a future value (*FV*) lump-sum amount to be received at the end of "*n*" periods in the future when the per-period interest rate is "*i*":

$$PV = \frac{FV}{(1+i)^n}$$

- Examples:
  - Lotto winner choosing between a single lump-sum payout of $104 million or $198 million over 25 years.
  - Determining damages in a patent infringement case.

Present Value vs. Future Value

- The present value (*PV*) reflects the difference between the future value and the opportunity cost of waiting (*OCW*).
- Succinctly,

$$PV = FV - OCW$$

- If $i = 0$, note $PV = FV$.
- As i increases, the higher is the *OCW* and the lower the *PV*.

Present Value of a Series

- Present value of a stream of future amounts (FV_t) received at the end of each period for "n" periods:

$$PV = \frac{FV_1}{(1+i)^1} + \frac{FV_2}{(1+i)^2} + \ldots + \frac{FV_n}{(1+i)^n}$$

- Equivalently,

$$PV = \sum_{t=1}^{n} \frac{FV_t}{(1+i)^t}$$

Net Present Value

- Suppose a manager can purchase a stream of future receipts (FV_t) by spending "C_0" dollars today. The *NPV* of such a decision is

$$NPV = \frac{FV_1}{(1+i)^1} + \frac{FV_2}{(1+i)^2} + \ldots + \frac{FV_n}{(1+i)^n} - C_0$$

Decision Rule:

If NPV < 0: Reject project

NPV > 0: Accept project

Present Value of a Perpetuity

- An asset that perpetually generates a stream of cash flows (CF_i) at the end of each period is called a perpetuity.
- The present value (PV) of a perpetuity of cash flows paying the same amount ($CF = CF_1 = CF_2 = \ldots$) at the end of each period is

$$PV_{Perpetuity} = \frac{CF}{(1+i)} + \frac{CF}{(1+i)^2} + \frac{CF}{(1+i)^3} + \ldots$$

$$= \frac{CF}{i}$$

Firm Valuation and Profit Maximization

- The value of a firm equals the present value of current and future profits (cash flows).

$$PV_{Firm} = \pi_0 + \frac{\pi_1}{(1+i)} + \frac{\pi_2}{(1+i)} + \ldots = \sum_{t=1}^{\infty} \frac{\pi_t}{(1+i)^t}$$

- A common assumption among economist is that it is the firm's goal to maximization profits.
  - This means the present value of current and future profits, so the firm is maximizing its value.

Firm Valuation With Profit Growth

- If profits grow at a constant rate ($g < i$) and current period profits are $\pi_{O,}$ before and after dividends are:

$PV_{Firm} = \pi_0 \frac{1+i}{i-g}$ before current profits have been paid out as dividends;

$PV_{Firm}^{Ex-Dividend} = \pi_0 \frac{1+g}{i-g}$ immediately after current profits are paid out as dividends.

- Provided that $g < i$.
  - That is, the growth rate in profits is less than the interest rate and both remain constant.

Marginal (Incremental) Analysis

- Control Variable Examples:
  - Output
  - Price
  - Product Quality
  - Advertising
  - R&D
- Basic Managerial Question: How much of the control variable should be used to maximize net benefits?

Net Benefits

- Net Benefits = Total Benefits - Total Costs
- Profits = Revenue - Costs

Marginal Benefit (MB)

- Change in total benefits arising from a change in the control variable, Q:

$$MB = \frac{\Delta B}{\Delta Q}$$

- Slope (calculus derivative) of the total benefit curve.

Marginal Cost (MC)

- Change in total costs arising from a change in the control variable, Q:

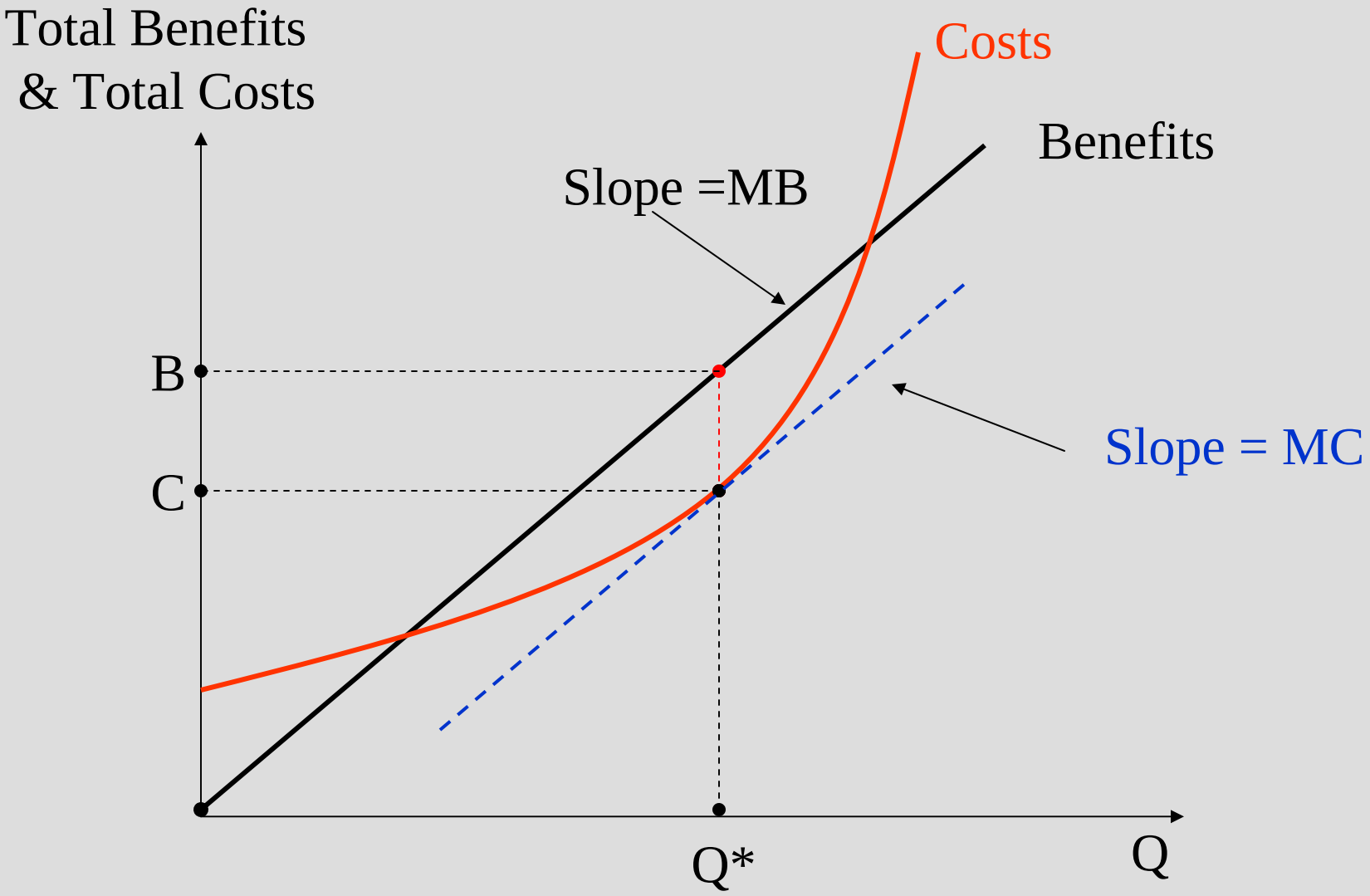
$$MC = \frac{\Delta C}{\Delta Q}$$

- Slope (calculus derivative) of the total cost curve

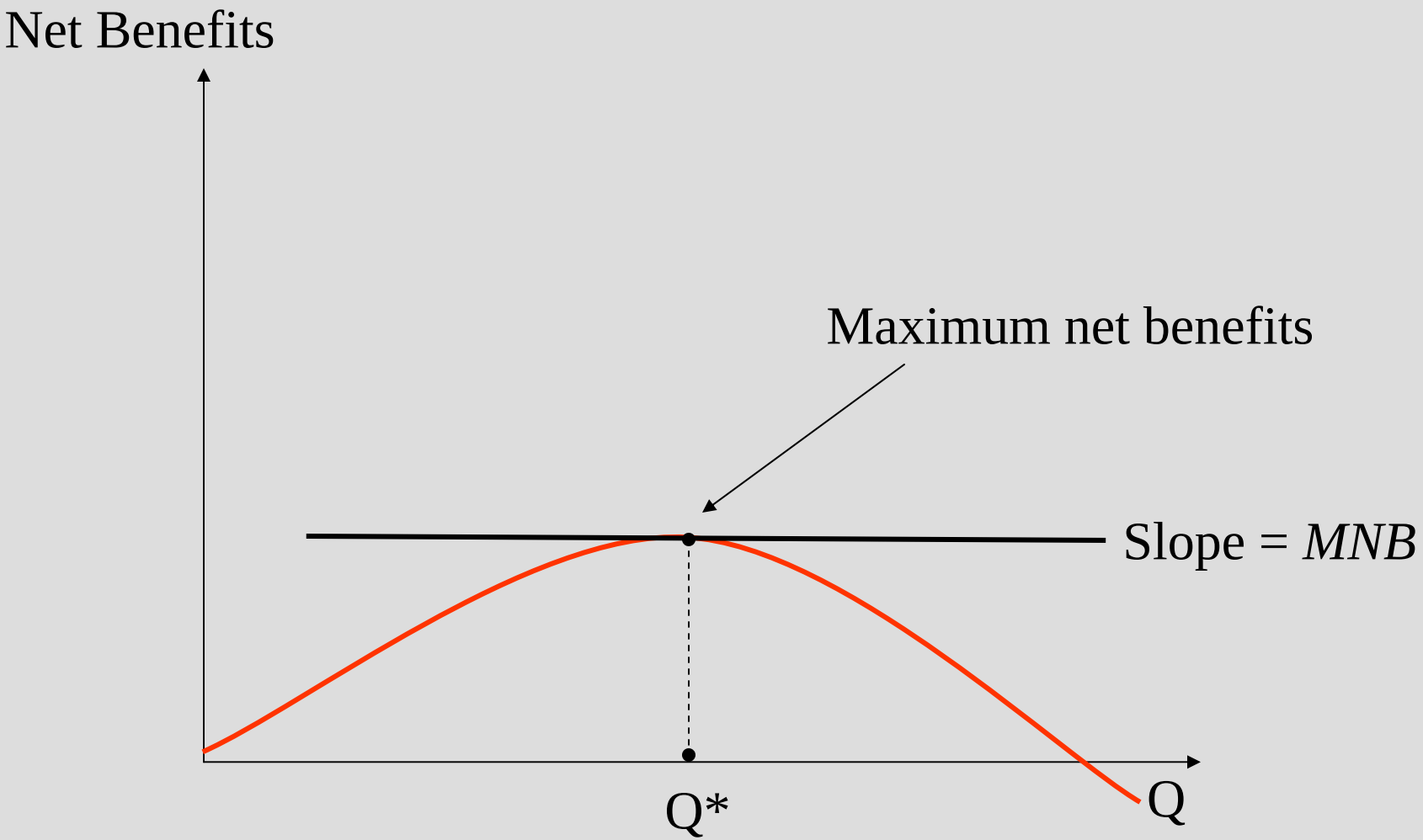
Marginal Principle

- To maximize net benefits, the managerial control variable should be increased up to the point where $MB = MC$.
- $MB > MC$ means the last unit of the control variable increased benefits more than it increased costs.
- $MB < MC$ means the last unit of the control variable increased costs more than it increased benefits.

The Geometry of Optimization: Total Benefit and Cost



The Geometry of Optimization: Net Benefits



Conclusion

- Make sure you include all costs and benefits when making decisions (opportunity cost).
- When decisions span time, make sure you are comparing apples to apples (PV analysis).
- Optimal economic decisions are made at the margin (marginal analysis).