ECO 518

ECONOMICS FOR DECISION MAKING

STUDY GUIDE

Textbook:

Managerial Economics: Economic Tools for Today's Decision Makers, 6th Edition

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Publisher: Prentice Hall, Upper Saddle River, New Jersey

ISBN 13: 978-0-13-604012-5

ISBN 10: 0-13-604012-8

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TABLE OF CONTENTS

Contents

HOW TO USE THIS GUIDE

This Study Guide is intended to facilitate understanding of key learning points found in the textbook. Read this guide as you go through each unit of your course. Reflect on the 'Ask Yourself' questions as a **TRA** (Transfer, Retention, and Application) method. The guide is organized as follows:

- An overview of learning objectives
- Key learning points of each chapter
- Activities
- Chapter Practice Exams (If provided)
- Chapter Discussion Questions
- Unit Exams
- Unit Assignments
- End of Course Survey
- Week 6 Discussion Questions
- Final Exam
- Course Project

This Guide is not a substitute for the textbook. The Summary at the end of each Chapter of the textbook highlights the learning points for each chapter and must be read.

The Syllabus for this Course is provided as a separate document in the 'Course Document Folder' Tab in your Course room. You will find the following information in the Syllabus:

- How to Study
- Credit Hours Defined
- Study Schedule
- Library Services
- Academic Integrity Policy
- University Policies
- Help Desk

You must read the Syllabus and other documents posted in the Course Document folder of your Course Room so you will understand how to maximize learning, grading requirements, and how to earn the desired grade.

Faculty qualifications and contact information are available in the General Discussion Forum of your Course Room as an attachment entitled: Instructor Policies. Please do not hesitate to contact your course instructor if you have questions.

ACADEMIC INTEGRITY POLICY

Ideas and learning form the core of the academic community. In all centers of education, learning is valued and honored. No learning community can thrive if its members compromise their achievement and seek to establish an unfair advantage over their fellow student/learners. The academic standards are based on a pursuit of knowledge and assume a high level of integrity in every one of its members.

When this trust is violated, the academic community suffers injury and must act to ensure that its standards remain meaningful. The vehicle for this action is the Academic Integrity Policy outlined in CalUniversity's Student Handbook.

The Academic Integrity Policy is designed to foster a fair and impartial set of standards upon which academic dishonesty will be judged.

All student/learners are required to read, understand, and adhere to these standards, which define and specify the following mandatory sanctions for such dishonest acts as copying, plagiarism, lying, and unauthorized collaboration, alteration of records, bribery, or misrepresentation for the purpose of enhancing one's academic standing.

Please comply with the following:

1. Please read your Instructor's policy on submitting papers for plagiarism check and the consequences of plagiarism
2. Sign and submit the Probity Form (See Course Room Important Documents) to the General Discussion Forum
3. Submit your paper for plagiarism check (Go to the Student Resource Center). The similarity index should not be higher than 20%. If it is higher than 20%, reduce the percentage by deleting or paraphrasing the words identified as matching other papers. Submit your papers for grading only after you have taken this step.
4. Know the consequence of plagiarism:
    a. First Offense – Instructor's discretion (See Instructor Policies)
    b. Second Offense – "F" grade for the paper; student to attend and complete plagiarism workshop
    c. Third Offense – "F" grade for the course; student may be placed on academic probation/dismissal at the discretion of the Chief Academic Officer

If you need more information on plagiarism, contact your Student Advisor to register for a workshop on how to avoid plagiarism.

COURSE OVERVIEW

ECO 518: MANAGERIAL ECONOMICS

Course Description:

This course introduces learners to the study of managerial economics as a discipline that combines microeconomic theory with management practice. This course focuses on how economic theory and concepts apply to management decision, referring to the important function of a manager to decide how to allocate a firm's resources. Emphasis is on the application of economic theory and concepts of economics in real managerial situations. The course provides information on how optimal decisions are made in the best economic interests of the firm such as the selection of a firm's products or services, the hiring of personnel, the assigning of personnel to particular functions or tasks, the purchase of materials and equipment, and the pricing of products and services.

Course Objectives:

- To provide the learner with a basic understanding of the economic theory and analytical tools for decision making
- The application of economic theory and concepts in real managerial situations

Learning Outcomes (LO):

At the end of the course, learners will be able to:

LO 1. Define managerial economics and discuss briefly its relationship to microeconomics.
LO 2. Cite the important types of decisions that managers must make concerning the allocation of a company's scarce resources.
LO 3. Provide specific examples of how changes in customers, competition, and technology can affect the ability of a company to earn an acceptable return on its owners' investments.
LO 4. Cite and compare the three basic economic questions from the standpoint of both a country and a company. Define managerial economics.
LO 5. Define supply, demand, and equilibrium price.
LO 6. List and provide specific examples of the nonprice determinants of supply and demand.
LO 7. Distinguish between the short-run rationing function and the long-run guiding function of price.
LO 8. Illustrate how the concepts of supply and demand can be used to analyze market conditions in which management decisions about price and allocations of resources must be made.
LO 9. Use supply and demand diagrams to show how the determinants of supply and demand interact to determine market price in the short run and in the long run.

LO 10. Define and measure elasticity.
LO 11. Apply the concepts of price elasticity, cross-elasticity, and income elasticity.
LO 12. Understand the determinants of elasticity.
LO 13. Show how elasticity affects revenue.
LO 14. Specify the components of a regression model that can be used to estimate a demand equation.
LO 15. Interpret the regression results (i.e., explain the quantitative impact that changes in the determinants have on the quantity demanded).
LO 16. Explain the meaning of R2.
LO 17. Evaluate the statistical significance of the regression coefficients using the t-test and the statistical significance of R2 using the F-test.
LO 18. Recognize the challenges of obtaining reliable cross-sectional and time series data on consumer behavior that can be used in regression models of demand.
LO 19. Understand the importance of forecasting in business.
LO 20. Describe six different forecasting techniques.
LO 21. Show how to carry out least squares projections, and decompose them into trends, seasonal, cyclical, and irregular movements.
LO 22. Explain basic smoothing methods of forecasting, such as the moving average and exponential smoothing.
LO 23. Define the production function and explain the difference between a short-run and a long-run production function.
LO 24. Explain the "law of diminishing returns" and how it relates to the Three Stages of Production.
LO 25. Define the Three Stages of Production and explain why a rational firm always tries to operate in Stage II.
LO 26. Provide examples of types of inputs that might go into a production function for a manufacturing company and for a service company.
LO 27. Describe the various forms of a production function that are used in the statistical estimation of these functions.
LO 28. Briefly describe the Cobb-Douglas function and cite a few statistical studies that used this particular functional form in their analysis.
LO 29. Define the cost function and explain the difference between a short-run and a long-run cost function.
LO 30. Explain the linkages between the production function and the cost function.
LO 31. Distinguish between economic cost and accounting cost.
LO 32. Explain how the concept of relevant cost is used in the economic analysis of cost.
LO 33. Define short-run total cost, short-run total variable cost, and total fixed cost and explain their relationship to each other.
LO 34. Define average cost, average variable cost, and average fixed cost and explain their relationship to each other in the short run. Do the same for average cost and average variable cost in the long run.

LO 35. Compare and contrast the short-run cost function and the long-run cost function and explain why economies of scale is considered to be a long-run phenomenon.
LO 36. Provide at least four reasons for the existence of economies of scale.
LO 37. Identify the types of capital budgeting decisions.
LO 38. Show how to calculate the net present value and the internal rate of return, and understand the difference between the two.
LO 39. Identify different types of cash flows, and explain how they fit into the capital budgeting calculation.
LO 40. Define the cost of capital, and demonstrate how it is calculated.
LO 41. Explain the meaning of the capital budgeting model.
LO 42. Define capital rationing.
LO 43. Define risk and uncertainty.
LO 44. Describe and calculate various measures of risk, such as the expected value, standard deviation, and coefficient of variation.
LO 45. Explain the meaning of the risk-adjusted discount rate and certainty equivalents.
LO 46. Distinguish between sensitivity analysis and scenario analysis.
LO 47. Describe how to calculate simulations and decision trees.
LO 48. Explain how real options can improve capital budgeting calculations.
LO 49. Cite the five major functions of government in a market economy.
LO 50. Explain the reasoning of the Coase theorem in its contention that government involvement may not be necessary to deal with market externalities.
LO 51. Explain why firms merge and why, in particular, firms have chosen to merge in markets that have experienced government deregulation.
LO 52. Briefly explain the process that a private firm must follow in securing a government contract.
LO 53. Describe the market structure of the beverage industry and cite the main factors that affect the degree of competitiveness in this industry.
LO 54. Cite specific ways that the activities in the beverage industry illustrate the major economic concepts presented in this text (e.g., supply and demand, cost function, production function, forecasting).
LO 55. Cite ways that the activities involved in creating an annual plan in the beverage industry illustrate the major economic concepts presented in this text.
LO 56. Describe the “changing economics” of the soft drink industry and explain how Coca-Cola, Inc. and PepsiCo, Inc. have adjusted their strategy in the beverage market accordingly.

UNIT ONE

Chapters & Learning Outcomes

CHAPTER ONE

The key points of the following chapters (see textbook) will be discussed in this Unit:

- Chapter One
  Introduction to Economics and Decision Making pages 01 to 23
- Chapter Two
  The Firm and Its Goals pages 24 to 44
- Chapter Three
  Supply and Demand pages 45 to 76

UNIT ONE LEARNING OUTCOMES

LO 1. Define managerial economics and discuss briefly its relationship to microeconomics.
LO 2. Cite the important types of decisions that managers must make concerning the allocation of a company's scarce resources.
LO 3. Provide specific examples of how changes in customers, competition, and technology can affect the ability of a company to earn an acceptable return on its owners' investments.
LO 4. Cite and compare the three basic economic questions from the standpoint of both a country and a company. Define managerial economics.
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LO 6. List and provide specific examples of the nonprice determinants of supply and demand.
LO 7. Distinguish between the short-run rationing function and the long-run guiding function of price.
LO 8. Illustrate how the concepts of supply and demand can be used to analyze market conditions in which management decisions about price and allocations of resources must be made.
LO 9. Use supply and demand diagrams to show how the determinants of supply and demand interact to determine market price in the short run and in the long run.

CHAPTER ONE

Introduction

KEY LEARNING POINTS

Managerial economics is a discipline that combines microeconomic theory with management practice. Microeconomics is the study of how choices are made to allocate scarce resources with competing uses. An important function of a manager is to decide how to allocate a firm's scarce resources. Examples of such decisions are the selection of a firm's products or services, the hiring of personnel, the assigning of personnel to particular functions or tasks, the purchase of materials and equipment, and the pricing of products and services. Managerial economics shows how the application of economic theory and concepts helps managers make allocation decisions that are in the best economic interests of their firms. Throughout the text, numerous examples are cited to illustrate how economic theory and concepts can be applied to management decision making. References are also made to business cases and economic events that have been reported in the popular press.

Chapter One begins with a discussion on a Case: "The Situation", which discusses Global Foods, Inc. and their venture into the soft drink business (**pages 1 to 2**). This case illustrates the importance of understanding and using managerial economics to analyze and make business decisions for the successful utilization of an organization's scarce resources. The solutions that end the chapter suggest ways that economic analysis can assist in the decision-making process.

Review Figure 1.1 (p.4) Managerial Economics and Other Business Disciplines helps you identify how economics relates to other business functions.

Review Figure 1.2 (p. 4) Four Stages of Change which illustrates the impact of changing economics on well-established companies can be better understood and appreciated within the framework of a four-stage model of change.

Ask yourself: What are the four stages of change faced by firms?

Important Questions Managers Must Answer (p. 3)

1. What are the economic conditions in our particular market?
    a. Market Structure?
    b. Supply Structure?
    c. Supply and demand?
    d. Technology?
2. What are the economic conditions in our particular market?
    a. Government regulations?
    b. International dimensions?
    c. Future conditions?

   d. Macroeconomic factors?
3. Should our firm be in this business?
   a. If so, at what price?
   b. And at what output level?
4. How can we maintain a competitive advantage over other firms?
   a. Cost-leader?
   b. Product differentiation?
   c. Market niche?
   d. Outsourcing, alliances, mergers?
   e. International perspective?
5. What are the risks involved?
   a. Shifts in demand/supply conditions?
   b. Technological changes?
   c. The effect of competition?
   d. Changing interest rates and inflation rates?
   e. Exchange rates (for companies in international trade)?
   f. Political risk (for firms with foreign operations)?

Risk is the chance that actual future outcomes will differ from those expected

Ask yourself: What economic conditions are relevant in managerial decision-making?

Important Concepts and Meanings (p. 22)

This section provides definitions of important concepts

Command process - The use of central planning and the directives of government authorities to answer the questions of what, how, and for whom. (p. 11)

Economic decisions for the firm - "What goods and services should be produced?"—the product decision. "How should these goods and services be produced?"—the hiring, staffing, and capital-budgeting decision. "For whom should these goods and services be produced?"—the market segmentation decision. (p. 1 2)

Economics - The study of how choices are made under conditions of scarcity. The basic economic problem can be defined as: "What goods and services should be produced and in what quantities?" "How should these goods and services be produced?" "For whom should these goods and services be produced?" (p. 2)

Economics of a business - The key factors that affect the ability of a firm to earn an acceptable rate of return on its owners' investment. The most important of these factors are competition, technology, and customers. (p. 5)

Managerial economics - The use of economic analysis to make business decisions involving the best use of a firm's scarce resources. (p. 2)

Market process - The use of supply, demand, and material incentives to answer the questions of what, how, and for whom. (p. 1 1)

Opportunity cost - The amount or subjective value forgone in choosing one activity over the next best alternative. This cost must be considered whenever decisions are made under conditions of scarcity. (p. 1 0)

Resources - Also referred to as factors of production or inputs, economic analysis usually includes four basic types: land, labor, capital, and entrepreneurship. This chapter also includes managerial safe skills and entrepreneurship. (p. 9)

Scarcity - A condition that exists when resources are limited relative to the demand for their use. In the market process, the extent of this condition is reflected in the price of resources or the goods and services they produce. (p. 9)

Traditional process - The use of customs and traditions to answer the questions of what, how, and for whom. (p. 11)

Ask yourself: How do the three basic economic questions relate to the firm?

Global Application: Reinventing the Corporation through Strategy and Ownership. (p. 19)

Review how Western Union, although began over 100 years ago, due to major changes in the economics of their business (huge changes in technology) had to reinvent itself by diversifying and branching out into the money transfer business in order to survive.

Activities

Chapter One Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week One Discussion Question (Chapter One):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

What economic conditions are relevant in managerial decision-making?

(Note: Your instructor will post the question to the Week One Weekly Discussion Question Forum)

CHAPTER TWO

The Firm and Its Goal

KEY LEARNING POINTS

Chapter 2 elaborates on the process of making decisions under conditions of scarcity by discussing the goals of a firm and the economic significance of the optimal decision while illustrating key economic concepts and methods of analysis.

The Firm (p. 25)

Here are some very important definitions which are discussed at length on page 25. A **firm** is a collection of resources that is transformed into products demanded by consumers.

The **Profit** is the difference between revenue received and costs incurred.

Transaction costs are incurred when entering into a contract.

Types of transaction costs:

a. investigation
b. negotiation
c. enforcing contracts

Examples of Firms are:

a. Kodak – uses off-shoring to source cameras
b. IBM – manufacturing computers overseas
c. exult – third party services used in human resources
d. investigation
e. negotiation
f. enforcing contracts

Economic Goal of the Firm (p. 29)

Profit maximization hypothesis: the primary objective of the firm (to economists) is to maximize profits:

- Other goals include market share, revenue growth, and shareholder value
- Optimal decision is the one that brings the firm closest to its goal

Short-run *versus* Long-run:

- nothing to do directly with calendar time
- short-run: firm can vary amount of some resources but not others

- long-run: firm can vary amount of all resources
- at times short-run profitability will be sacrificed for long-run purposes

Economic goals:

- market share, growth rate
- profit margin
- return on investment, Return on assets
- technological advancement
- customer satisfaction
- shareholder value

Non-economic objectives:

- good work environment
- quality products and services
- corporate citizenship, social responsibility

Ask yourself: What is the best example of an economic goal of a firm?

Do Companies Maximize Profits? (p. 32)

Criticism: companies do not maximize profits but instead merely aim to satisfy, which means to achieve a satisfactory goal, one that may not require the firm to 'do its best' two forces affect satisfying:

Position and power of stockholders:

- Shareholders are concerned with performance of entire portfolio and not individual stocks
- Less informed about the firm than management
- Stockholders not likely to take any action if earning a 'satisfactory' return

Position and power of management:

- High-level managers may own very little of the firm's stock
- Managers tend to be more conservative because jobs will likely be safe if performance is steady, not spectacular
- Managers may be more interested in maximizing own income and perks
- Management incentives may be misaligned (eg. revenue not profits)

Divergence of objectives is known as 'principal-agent' problem

Counter-arguments which support the profit maximization hypothesis:

- Large stockholdings held by institutions (mutual funds, banks, etc.) → scrutiny by professional analysts

- Stockmarket discipline → if managers do not seek to maximize profits, firms face threat of takeover
  - Incentive effect → the compensation of many executives is tied to stock price
  - Views the firm from the perspective of a stream of profits (cash flows) over time → the value of the stream depends on when cash flows occur
  - Requires the concept of the **time value of money:** says a dollar earned in the future is worth less than a dollar earned today

Ask yourself: What is one of the weaknesses you have noticed in your company in pursuing the objective of profit maximization?

Maximizing the Wealth of Stockholders (p. 38)

- Views the firm from the perspective of a stream of profits (cash flows) over time → the value of the stream depends on when cash flows occur
- Requires the concept of the **time value of money:** says a dollar earned in the future is worth less than a dollar earned today
- Future cash flows (Di) must be 'discounted' to find their present equivalent value
  - The **discount rate** (k) is affected by risk
- Two major types of risk:
  - Business risk
  - Financial risk
- **Business risk** involves variation in returns due to the ups and downs of the economy, the industry, and the firm
  - All firms face business risk to varying degrees
- **Financial risk** concerns the variation in returns that is induced by 'leverage'
  - Leverage is the proportion of a company financed by debt → the higher the leverage, the greater the potential fluctuations in stockholder earnings → financial risk is directly related to the degree of leverage

The present price of a firm's stock should reflect the discounted value of the expected future cash flows to shareholders (dividends)

Where P = $$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_n}{(1+k)^n}$$

D = dividends received per year

k = discount rate

n = life of firm in years

If the firm is assumed to have an infinitely long life, the price of a unit of stock which earns a dividend D per year is given by the equation:

$$P = D/k$$

Given an infinitely lived firm whose dividends grow at a constant rate (g) each year, the equation for the stock price becomes:

$$P = D1/(k-g)$$

where D1 is the dividend to be paid during the coming year

Multiplying P by the number of shares outstanding gives total value of firm's common equity ('market capitalization')

Company tries to manage its business in such a way that the dividends over time paid from its earnings and the risk incurred to bring about the stream of dividends always create the highest price for the company's stock.

When stock options are substantial part of executive compensation, management objectives tend to be more aligned with stockholder objective.

Market Value Added (MVA) (p. 38)

Another measure of the wealth of stockholders is called **Market Value Added (MVA)®**

MVA = difference between the market value of the company and the capital that the investors have paid into the company

Market value includes value of both **equity** and **debt**

'Capital' includes book value of equity and debt as well as certain adjustments

e.g. accumulated R&D and goodwill.

While the market value of the company will always be positive, MVA may be positive or negative

Economic Value Added (EVA) (p. 39)

Another measure of the wealth of stockholders is called **Economic Value Added (EVA)®**

EVA= (Return on total capital – Cost of capital) x Total capital

if EVA > 0 shareholder wealth rising

if EVA < 0 shareholder wealth falling

Ask yourself: What are the typical types of risk faced by a firm?

Economic Profits (p. 39)

Economic profits and accounting profits are typically different. For instance, Accountants measure explicit incurred costs, as allowed by GAAP and uses historical cost of machines. Economists are concerned with implicit costs, called opportunity costs. Accordingly, economists use replacement cost of machines:

→ economic costs include historical and explicit (accounting) costs as well as replacement and implicit (economic) costs

→ economic profit is total revenue minus all economic costs

Global Application: Other Countries and Other Cultures (p. 40)

It is important to recognize that multinational firms (e.g., a U.S. parent corporation operating in many different countries through subsidiaries or branches) will encounter restrictions and complications, which they must consider in doing business abroad. Some of these are as follows:

- Foreign currencies
- Legal differences
- Language
- Attitudes
- Role of government

Activities

Chapter Two Practice Exam (If provided):

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week One Discussion Question (Chapter Two):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **If a stock is expected to pay a dividend of $40 for the current year, what is the approximate present value of this stock, given at discount rate of 5% and a dividend growth rate of 3%?**

(Note: Your instructor will post the question to the Week One Weekly Discussion Question Forum)

CHAPTER THREE

Supply and Demand

KEY LEARNING POINTS

The chapter discusses the elements of supply and demand by introducing the law of demand and of supply, how price serves a short-run rationing function and a long-run guiding function in the market place. In addition, this chapter will discuss techniques involving the comparison of equilibrium points before and after changes in the market have occurred, as a standard way of analyzing problems.

Market Demand (p. 46)

Starting on page 46, the authors provided a good summary of Demand and Market Demand with an illustration of market demand for pizza.

Demand for a good or service is defined as quantities that people are ready (willing and able) to buy at various prices within some given time period.

Other factors besides price are held constant

Market demand is the sum of all the individual demands

PRICE (PER SLICE)	Q_{D1}	Q_{D2}	Q_{D3}	Q_{DM}
$2.00	0	2	3	5
1.50	1	2	5	8
1.00	2	2	8	12
0.50	3	3	10	16
0.05	4	4	12	20

Example: Demand for Pizza (p46)

The inverse relationship between price and the quantity demanded of a good or service is called the **Law of Demand**. Below you will find the example provided. (p. 47)

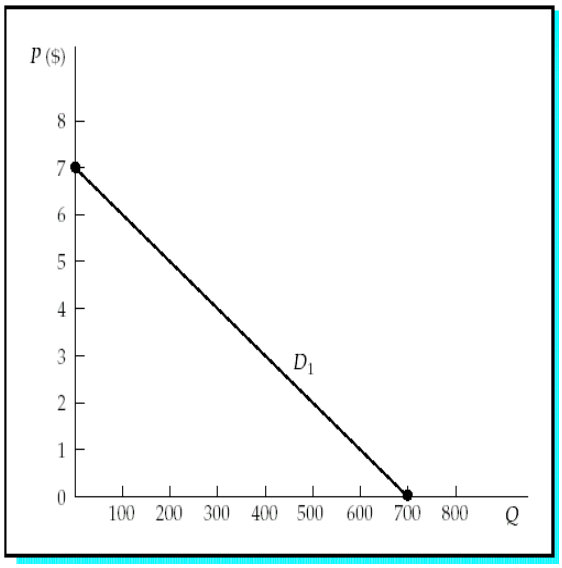


Figure 3.1 Market Demand Curve for Pizza (p. 47)

Changes in price result in changes in the quantity demanded. This is shown as movement *along* the demand curve.

Changes in non-price factors result in changes in demand. This is shown as a *shift* in the demand curve.

Nonprice determinants of demand:

- Tastes and preferences income
- Prices of related products
- Future expectations
- Number of buyers

Ask yourself: Suppose that the demand for oranges increase. What you think the long -run effects of the guiding function of price would be?

Ask yourself: What is the distinction between the "long run" and the "short run"?

Market Supply (p. 50)

The **supply** of a good or service is defined as quantities that people are ready to sell at various prices within some given time period.

Other factors besides price held constant

Changes in price result in changes in the quantity supplied → shown as movement *along* the supply curve.

Changes in non-price determinants result in changes in supply → shown as a *shift* in the supply curve

Nonprice determinants of supply:

- Costs and technology
- Prices of other goods or services offered by the seller
- Future expectations
- Number of sellers
- Weather conditions

Market Equilibrium (p. 52)

Equilibrium price: the price that equates the quantity demanded with the quantity supplied.

Equilibrium quantity: the amount that people are willing to buy and sellers are willing to offer at the equilibrium price level.

Shortage: a market situation in which the quantity demanded exceeds the quantity supplied → shortage occurs at a price *below* the equilibrium level.

Surplus: a market situation in which the quantity supplied exceeds the quantity demanded → surplus occurs at a price *above* the equilibrium level.

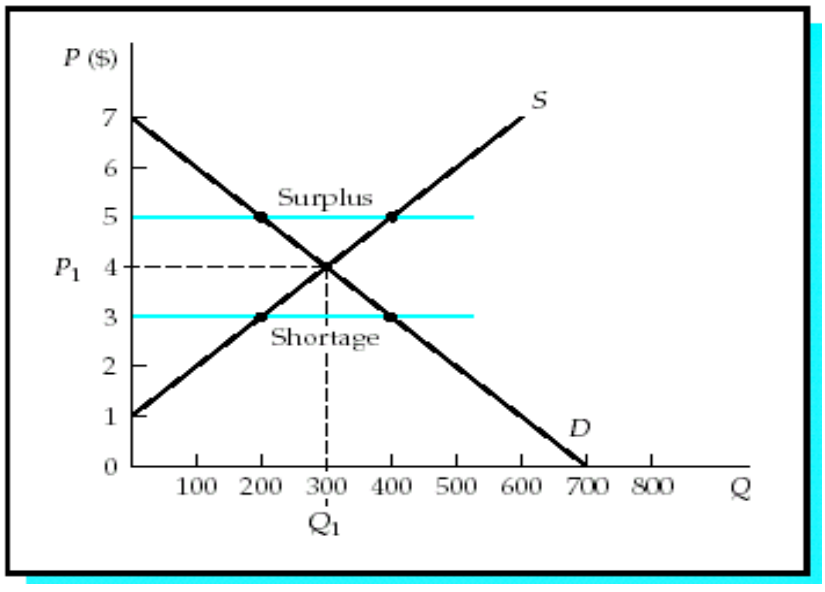


Figure 3.4 Supply and Demand Curves for Pizza, Indicating Market Equilibrium (p. 53)

Ask yourself: What are the factors that will cause the supply to increase for decrease on the following products:

- Crude oil
- Beef
- Computer memory chip

Comparative Statics Analysis (p. 53)

Comparative statics is a form of sensitivity (or *what-if*) analysis:

- Commonly used method in economic analysis
- Process of comparative statics analysis:
- State all the assumptions needed to construct the model
- Begin by assuming that the model is in equilibrium
- Introduce a change in the model, so a condition of disequilibrium is created
- Find the new point of equilibrium
- Compare the new equilibrium point with the original one

Step 1

Assume all factors except the price of pizza are constant

Buyers' demand and sellers' supply are represented by lines shown

Step 2

Begin the analysis in equilibrium as shown by Q1 and P1

Step 3

Assume that a new study shows pizza to be the most nutritious of all fast foods

Consumers increase their demand for pizza as a result

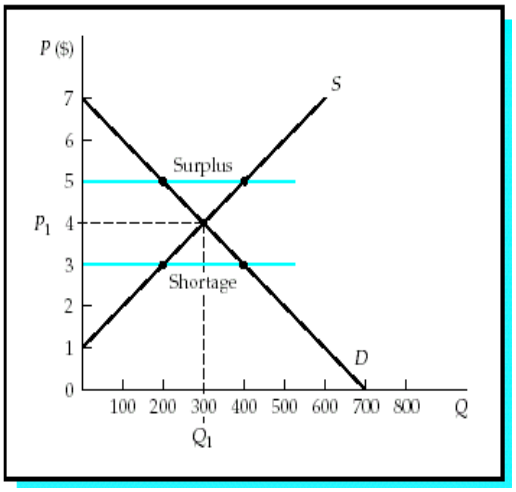


Figure 3.4 Supply and Demand Curves for Pizza, Indicating Market Equilibrium (p. 53)

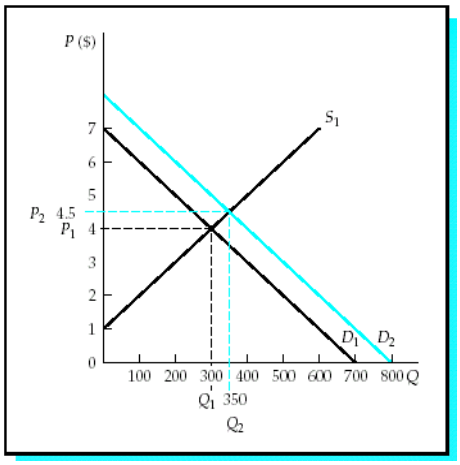


Figure 3.5 Increases in Demand for Pizza and Resulting Impact on Market Equilibrium (p. 54)

Step 4

The shift in demand results in a new equilibrium price (P2) and a new equilibrium quantity (Q2)

Step 5

Comparing the new equilibrium point with the original one, we see that both equilibrium price and quantity have increased

The **short run** is the period of time in which:

- Sellers already in the market respond to a change in equilibrium price by adjusting variable inputs
- Buyers already in the market respond to changes in equilibrium price by adjusting the quantity demanded for the good or service

Short run changes show the **rationing function of price**

- The rationing function of price is the change in market price to eliminate the imbalance between quantities supplied and demanded is the change in market price to eliminate the imbalance between quantities supplied and demanded

Short-run Analysis (p. 53)

An increase in demand causes equilibrium price and quantity to rise:

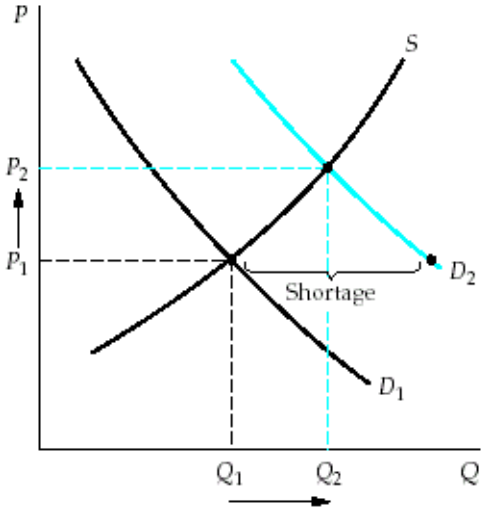


Figure 3.6 Changes in Supply and Demand and Their Short-Run Impact on Market Equilibrium (the Rationing Function of Price) (p. 55)

A decrease in demand causes equilibrium price and quantity to fall:

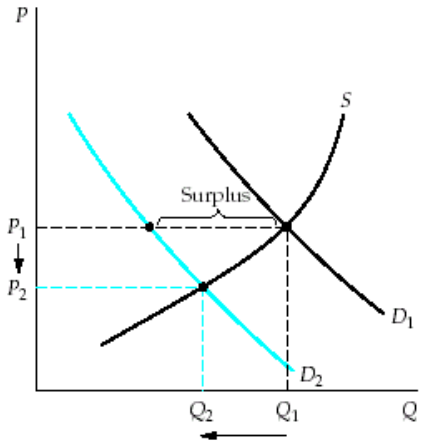


Figure 3.6 Changes in Supply and Demand and Their Short-Run Impact on Market Equilibrium (the Rationing Function of Price) (p. 55)

An increase in supply causes equilibrium price to fall and equilibrium quantity to rise:

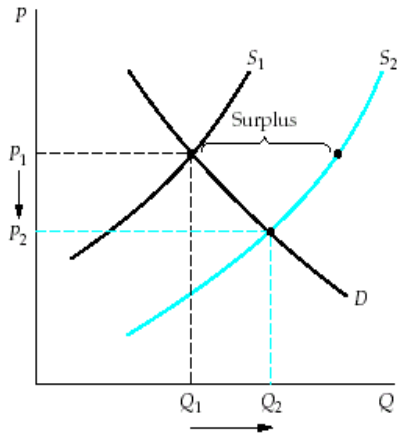


Figure 3.6 Changes in Supply and Demand and Their Short-Run Impact on Market Equilibrium (the Rationing Function of Price) (p. 55)

A decrease in supply causes equilibrium price to rise and equilibrium quantity to fall:

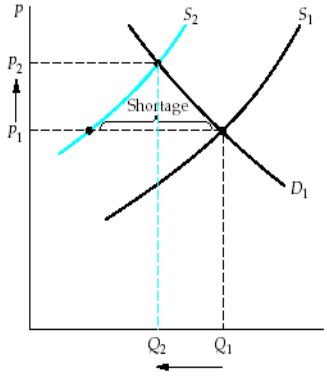


Figure 3.6 Changes in Supply and Demand and Their Short-Run Impact on Market Equilibrium (the Rationing Function of Price) (p. 55)

Long-run Analysis (p. 46)

The **long run** is the period of time in which:

- New sellers may enter a market
- Existing sellers may exit from a market
- Existing sellers may adjust fixed factors of production
- Buyers may react to a change in equilibrium price by changing their tastes and preferences
- Long run changes show the allocating function of price

The **guiding** or **allocating function** of price is the movement of resources into or out of markets in response to a change in the equilibrium price.

Initial change: decrease in demand from D1 to D2:

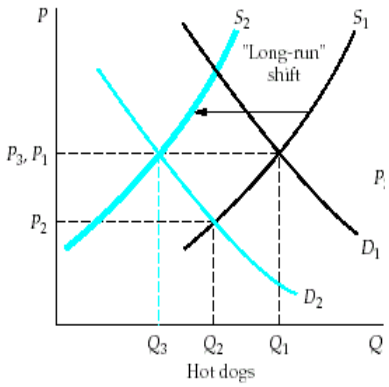


Figure 3.7 Short-Run and long-Run Changes in Supply (in Response to an Initial Change in Demand)

Result: reduction in equilibrium price and quantity (to P2,Q2)

Follow-on adjustment:

Movement of resources out of the market
Leftward shift in the supply curve to S2
→ equilibrium price and quantity (to P3,Q3)

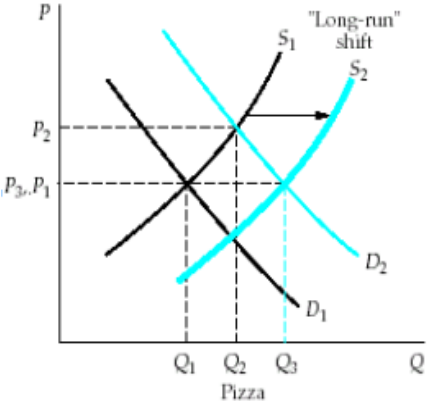


Figure 3.7 Short-Run and long-Run Changes in Supply (in Response to an Initial Change in Demand)

Initial change: increase in demand from D1 to D2
Result: increase in equilibrium price and quantity (to P2,Q2)
Follow-on adjustment:
Movement of resources into the market
Rightward shift in the supply curve to S2
→ equilibrium price and quantity (to P3,Q3)

Supply, Demand, and Price: The Managerial Challenge (p. 61)

In the extreme case, the forces of supply and demand are the sole determinants of the market price, not any single firm this type of market is 'perfect competition'

In many cases, individual firms can exert market power over price because of their: Dominant size ability to differentiate their product through advertising, brand name, features, or services

Example: coffee

'Buy low, sell high'
2000: overproduction led to price falls
2004: prices moved up again
Starbucks effects

Ask yourself: List the major non-price determinants of supply

Ask yourself: Suppose that macroeconomic forecasters predict that the economy will be expanding in the near future. How might managers use this information?

Global application: The Market for Cobalt (p. 64)

Review the Market for Cobalt and consider the following main points:

- Rare metal
- Produced as a by-product
- Strategic item
- Prices rising

Activities

Chapter Three Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week One Discussion Question (Chapter Three):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **The market for milk is in equilibrium. Recent health reports indicate that calcium is absorbed better in natural forms such as milk, and at the same time, the cost of milking equipment rises. Carefully analyze the probable effects on the market.**

(Note: Your instructor will post the question to the Week One Weekly Discussion Question Forum)

UNIT ONE ASSIGNMENTS

Unit One Exam

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the Week On] section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Unit One Case Analysis

Write a 3 to 5 page paper (1000 to 1500 words) in APA format on the following:

a) Read Case 3.1 Coffee: "Buy Low and Sell High" (P 62)
b) Write a Statement of the Problem - Discuss the issues identified and the ramification
c) Propose a solution - Use some key concepts and models proposed in this unit.
d) Learning Application - Summarize what an outside reader can take away from having read your analysis. Cite source with in-text citations.

Below is a recommended outline.

1. Cover page (See APA Sample paper)

2. Introduction

    a) A thesis statement
    b) Purpose of paper
    c) Overview of paper

3. Body

    a) Statement of the Problem - Discuss the issues identified and the ramification
    b) Proposing a solution - Use some key concepts and models proposed in this unit
    c) Learning Application - Summarize what an outside reader can take away from having read your analysis. Cite source with in-text citations.

4. Conclusion – Summary of main points and recommendations

5. References – List the references you cited in the text of your paper according to APA format.

    (Note: Do not include references that are not cited in the text of your paper)

GRADING

Your instructor will provide a grading rubric to evaluate your paper. Please see the Instructor Syllabus and Policies for details.

UNIT TWO

Chapters & Learning Outcomes

The key points of the following chapters (see textbook) will be discussed in this Unit:

- Chapter Four
  Demand Elasticity pages 77 to 123
- Chapter Five
  Demand Estimation and Forecasting pages 124 to 185
- Chapter Six
  The Theory and Estimation of Production pages 186 to 251

UNIT TWO LEARNING OUTCOMES

This Unit meets the following learning outcomes:

LO 10. Define and measure elasticity.
LO 11. Apply the concepts of price elasticity, cross-elasticity, and income elasticity.
LO 12. Understand the determinants of elasticity.
LO 13. Show how elasticity affects revenue.
LO 14. Specify the components of a regression model that can be used to estimate a demand equation.
LO 15. Interpret the regression results (i.e., explain the quantitative impact that changes in the determinants have on the quantity demanded).
LO 16. Explain the meaning of R2.
LO 17. Evaluate the statistical significance of the regression coefficients using the t-test and the statistical significance of R2 using the F-test.
LO 18. Recognize the challenges of obtaining reliable cross-sectional and time series data on consumer behavior that can be used in regression models of demand.
LO 19. Understand the importance of forecasting in business.
LO 20. Describe six different forecasting techniques.
LO 21. Show how to carry out least squares projections, and decompose them into trends, seasonal, cyclical, and irregular movements.
LO 22. Explain basic smoothing methods of forecasting, such as the moving average and exponential smoothing.
LO 23. Define the production function and explain the difference between a short-run and a long-run production function.
LO 24. Explain the “law of diminishing returns” and how it relates to the Three Stages of Production.

LO 25. Define the Three Stages of Production and explain why a rational firm always tries to operate in Stage II.

LO 26. Provide examples of types of inputs that might go into a production function for a manufacturing company and for a service company.

LO 27. Describe the various forms of a production function that are used in the statistical estimation of these functions.

LO 28. Briefly describe the Cobb-Douglas function and cite a few statistical studies that used this particular functional form in their analysis.

CHAPTER FOUR

Demand Elasticity

KEY LEARNING POINTS

Chapter 4 discusses the question of how sensitive the change in quantity demanded is to a change in price. The measurement of this sensitivity in percentage terms is called the price elasticity of demand.

The Economic Concept of Elasticity (p. 78)

Elasticity: the percentage change in one variable relative to a percentage change in another.

$$\text{Coefficient of Elasticity} = \frac{\text{percent change in A}}{\text{percent change in B}}$$

Price Elasticity of Demand (p. 78)

Price elasticity of demand: the percentage change in quantity demanded caused by a 1 percent change in price.

$$E_p = \frac{\%\Delta \text{ Quantity}}{\%\Delta \text{ Price}}$$

Measurement of Price Elasticity (p. 79)

Arc elasticity: elasticity which is measured over a discrete interval of a curve

Ep = coefficient of arc price elasticity
Q1 = original quantity demanded
Q2 = new quantity demanded
P1 = original price
P2 = new price

Examples: some real world elasticities

a. White pan bread:-0.69
b. Cigarettes: short run -0.4, long run -0.6
c. Wine imports: -0.15
d. Crude oil: -0.06
e. Internet services: -0.6/-0.7

Ask yourself: What do you think the Price elasticity of Beer is?

Point elasticity: elasticity measured at a given point of a demand (or a supply) curve:

$$\varepsilon_p = \frac{dQ}{dP} x \frac{P_1}{Q_1}$$

The point elasticity of a linear demand function can be expressed as:

$$\varepsilon_p = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

Ask yourself: Do you know the definition of Elasticity as it applies to economics?

Elasticity varies along a linear demand curve

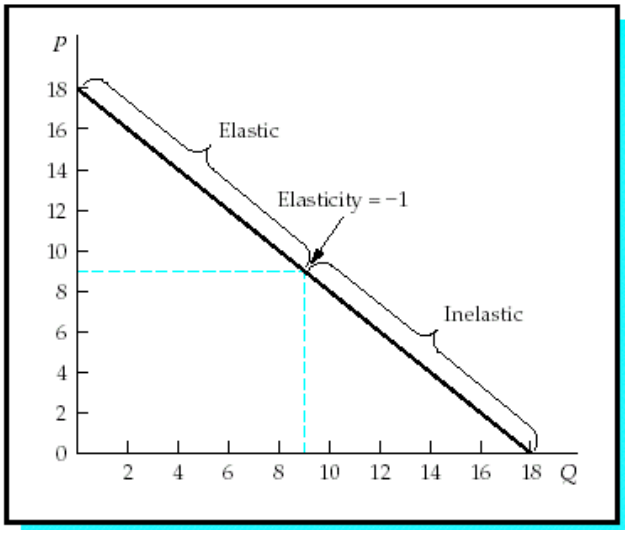


Figure 4.5 The Elasticity-Demand Relationship

Some demand curves have **constant elasticity**

→ such a curve has a nonlinear equation:

$$Q = aP^{-b}$$

where $-b$ is the elasticity coefficient

Categories of elasticity

- Relative elasticity of demand: Ep > 1
- Relative inelasticity of demand: 0 < Ep < 1
- Unitary elasticity of demand: Ep = 1

- Perfect elasticity: Ep = ∞
- Perfect inelasticity: Ep = 0

Factors affecting demand elasticity

- Ease of substitution
- Proportion of total expenditures
- Durability of product
    - Possibility of postponing purchase
    - Possibility of repair
    - Used product market
    - Length of time period

Derived demand: the demand for products or factors that are not directly consumed, but go into the production of another (final) product.

The demand for such a product or factor exists because there is demand for the final product

The derived demand curve will be more inelastic:

- The more essential is the component
- The more inelastic is the demand curve for the final product
- The smaller is the fraction of total cost going to this component
- The more inelastic is the supply curve of cooperating factors

A long-run demand curve will generally be more elastic than a short-run curve

As the time period lengthens consumers find ways to adjust to the price change, via substitution or shifting consumption (Figure 4.4).

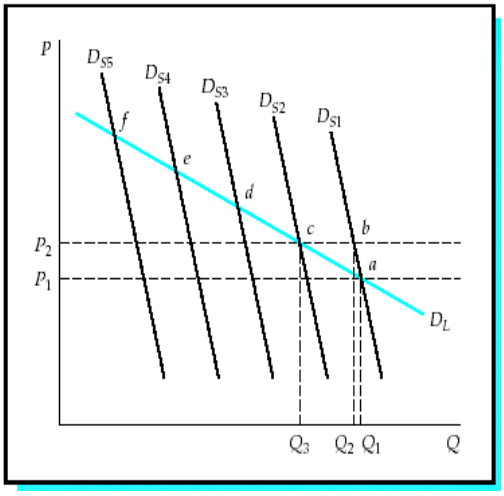


Figure 4.4 Short-Run versus Long-Run Elasticity

The relationship between price and revenue depends on elasticity

Why? By itself, a price fall will reduce receipts … BUT because the demand curve is downward sloping, the drop in price will also increase quantity demanded

→ Q: which effect will be stronger?

The relationship between price and revenue depends on elasticity

Why? By itself, a price fall will reduce receipts … BUT because the demand curve is downward sloping, the drop in price will also increase quantity demanded

→ Q: which effect will be stronger?

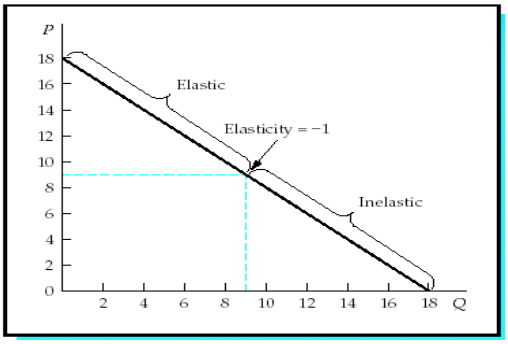


Figure 4.5 The Elasticity – Demand Relationship

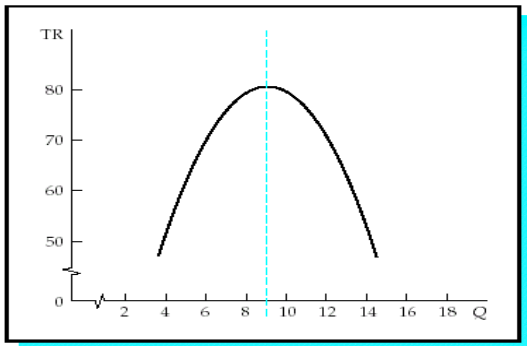


Figure 4.6 The Effect of Elasticity on Total Revenue

Marginal revenue: the change in total revenue resulting from changing quantity by one unit

$$MR = \frac{\Delta \text{Total Revenue}}{\Delta Quantity}$$

Ask yourself: **Can** you explain the difference between point elasticity and arc elasticity?

Marginal revenue curve is twice as steep as the demand curve

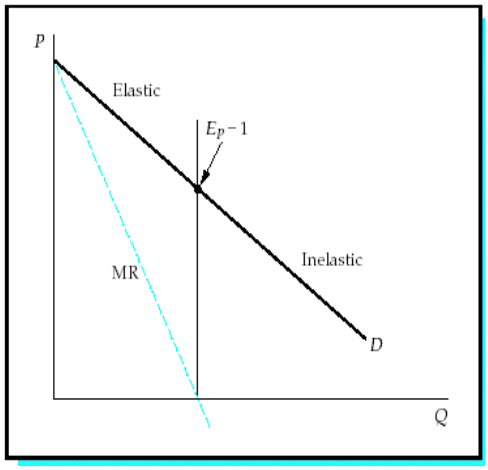


Figure 4.7 The Relationship between Demand and marginal Revenue

At the point where marginal revenue crosses the X-axis, the demand curve is unitary elastic and total revenue reaches a maximum:

Elasticity of Supply

When the supply curve is more elastic, the effect of a change in demand will be greater on quantity than on the price of the product

When the supply curve is less elastic, a change in demand will have a greater effect on price than on quantity

Examples: some real world elasticities

1. coffee: short run -0.2, long run -0.33
2. kitchen and household appliances:
3. -0.63
4. meals at restaurants: -2.27
5. airline travel in U.S.: -1.98
6. beer: -0.84, Wine: -0.55

Cross-Elasticity of Demand (p. 94)

Cross-elasticity of demand: the percentage change in quantity consumed of one product as a result of a 1 percent change in the price of a related product.

Arc cross-elasticity: $E_x = \frac{\%\Delta Q_A}{\%\Delta P_B}$ $E_x = \frac{Q_{2A} - Q_{1A}}{(Q_{1A} + Q_{2A})/2} \div \frac{P_{2B} - P_{1B}}{(P_{1B} + P_{2B})/2}$

Point cross-elasticity: $E_X = \frac{\Delta Q_A}{Q_A} \div \frac{\Delta P_B}{P_B}$ $E_Y = \frac{Q_2 - Q_1}{(Q_1 + Q_2)/2} \div \frac{Y_2 - Y_1}{(Y_1 + Y_2)/2}$

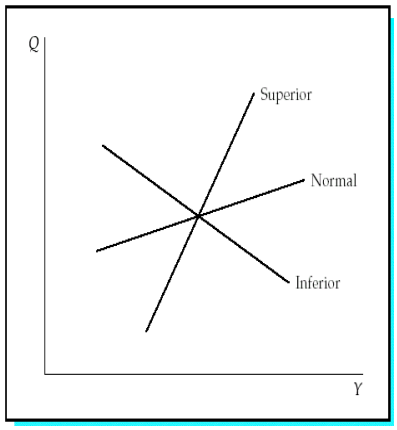
- The sign of cross-elasticity for substitutes is positive
- The sign of cross-elasticity for complements is negative
- Two products are considered good substitutes or complements when the coefficient is larger than 0.5 (in ab. value)

Income Elasticity

Income elasticity of demand: the percentage change in quantity demanded caused by a 1 percent change in income

Y is shorthand for income

Arc income elasticity:



Categories of income elasticity

- superior goods: EY > 1
- normal goods: 0 ≤ EY ≤ 1
- inferior goods: EY < 0

Other Demand Elasticities (p. 99)

Examples: elasticity is encountered every time a change in some variable affects demand;

- advertising expenditure
- interest rates
- population size

Elasticity of Price

Price elasticity of supply: the percentage change in quantity supplied as a result of a 1 percent change in price

$$E_S = \frac{\%\Delta \text{ Quantity Supplied}}{\%\Delta \text{ Price}}$$

The coefficient of supply elasticity is a normally a positive number

Elasticity of Supply (p. 100)

Arc elasticity of supply

$$E_s = \frac{Q_2 - Q_1}{(Q_1 + Q_2)/2} \div \frac{P_2 - P_1}{(P_1 + P_2)/2}$$

When the supply curve is more elastic, the effect of a change in demand will be greater on quantity than on the price of the product.

When the supply curve is less elastic, a change in demand will have a greater effect on price than on quantity.

Global Application: Price Elasticities in Asia (p. 100)

Review the below main points:

- Imports almost always price inelastic
- If exports price inelastic, export earnings will rise as prices rise
- If exports price elastic, export earnings will rise with world incomes

Activities

Chapter Four Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Two Discussion Question (Chapter Four):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

How would you present training material in a manner that facilitates retention?

(Note: Your instructor will post the question to the Week Two Weekly Discussion Question Forum)

CHAPTER FIVE

Demand Estimation and Forecasting

KEY LEARNING POINTS

Chapter 5 presents two important statistical approaches to estimating and forecasting the demand for a product. This chapter gives an overview of how the techniques of analysis are used in various types of studies.

Data Collection (p. 126)

Data for studies pertaining to countries, regions, or industries are readily available.

Data for analysis of specific product categories may be more difficult to obtain. To obtain them you could do the following:

- Buy from data providers (e.g. ACNielsen, IRI)
- Perform a consumer survey
- Focus groups
- Technology: point-of-sale, bar codes
- Regression analysis

Regression Analysis (p. 127)

Regression analysis: a procedure commonly used by economists to estimate consumer demand with available data

Two types of regression:

- Cross-sectional: analyze several variables for a single period of time
- Time series data: analyze a single variable over multiple periods of time

Regression equation: linear, additive

eg: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$

Y: dependent variable

a: constant value, y-intercept

X_n: independent variables, used to explain Y

b_n: regression coefficients (measure impact of independent variables)

Interpreting the regression results:

Coefficients:

- Negative coefficient shows that as the independent variable (X_n) changes, the variable (Y) changes in the opposite direction
- Positive coefficient shows that as the independent variable (X_n) changes, the dependent variable (Y) changes in the same direction
- Magnitude of regression coefficients is a measure of elasticity of each variable

Statistical evaluation of regression results:

t-test: test of statistical significance of each estimated coefficient

b = estimated coefficient
SE_b = standard error of estimated coefficient

$$t = \frac{\hat{b}}{SE_{\hat{b}}}$$

Statistical evaluation of regression results:

→ 'rule of 2': if absolute value of t is greater than 2, estimated coefficient is significant at the 5% level

→ if coefficient passes t-test, the variable has a true impact on demand

R^2 (coefficient of determination): percentage of variation in the variable (Y) accounted for by variation in all explanatory variables (X_n)

R^2 value ranges from 0.0 to 1.0

the closer to 1.0, the greater the explanatory power of the regression

F-test: measures statistical significance of the entire regression as a whole (not each coefficient)

Regression Results (p. 132)

Steps for analyzing regression results

- Check coefficient signs and magnitudes
- Compute implied elasticities
- Determine statistical significance

Example: estimating demand for pizza

Demand for pizza affected by

1. price of pizza
2. price of complement (soda) managers can expect price decreases to lead to lower revenue
   tuition and location are not significant

Identification problem: the estimation of demand may produce biased results due to simultaneous shifting of supply and demand curves

Solution: use advanced correction techniques, such as two-stage least squares and indirect least squares

Multicollinearity problem (p. 137): two or more independent variables are highly correlated, thus it is difficult to separate the effect each has on the dependent variable

Solution: a standard remedy is to drop one of the closely related independent variables from the regression

Autocorrelation problem (p. 137): also known as serial correlation, occurs when the dependent variable relates to the Y variable according to a certain pattern

Note: possible causes include omitted variables, or non-linearity; Durbin-Watson statistic is used to identify autocorrelation

Solution: to correct autocorrelation consider transforming the data into a different order of magnitude or introducing leading or lagging data

Ask yourself: Can you describe Regression Analysis?

Forecasting (p. 141)

Examples: common subjects of business forecasts:

- Gross domestic product (GDP)
- Components of GDP
    - eg consumption expenditure, producer durable equipment expenditure, residential construction
- Industry forecasts
    - eg sales of products across an industry
- Sales of a specific product

A good forecast should:

- Be consistent with other parts of the business
- Be based on knowledge of the relevant past
- Consider the economic and political environment as well as changes be timely

Forecasting Techniques (p. 143)

Factors in choosing the right forecasting technique:

Item to be forecast

Interaction of the situation with the forecasting methodology

Amount of historical data available

Time allowed to prepare forecast

Approaches to forecasting

- **Qualitative** forecasting is based on judgments expressed by individuals or group
- **Quantitative** forecasting utilizes significant amounts of data and equations

- **Naïve** forecasting projects past data without explaining future trends
- **Causal** (or explanatory) forecasting attempts to explain the functional relationships between the dependent variable and the independent variables

Six forecasting techniques

- Expert opinion
- Opinion polls and market research
- Surveys of spending plans
- Economic indicators
- Projections
- Econometric models

Expert opinion techniques

- Jury of executive opinion: forecasts generated by a group of corporate executives assembled together *Drawback: persons with strong personalities may exercise disproportionate influence*
- The Delphi method: a form of expert opinion forecasting that uses a series of questions and answers to obtain a consensus forecast, where experts do not meet

Opinion polls: sample populations are surveyed to determine consumption trends

- May identify changes in trends
- Choice of sample is important
- Questions must be simple and clear

Market research: is closely related to opinion polling and will indicate not only why the consumer is (or is not) buying, but also

- Who the consumer is
- How he or she is using the product
- Characteristics the consumer thinks are most important in the purchasing decision

Surveys of spending plans: yields information about 'macro-type' data relating to the economy, especially:

- Consumer intentions
    - Examples: Survey of Consumers (University of Michigan); Consumer Confidence Survey (Conference Board)
- Inventories and sales expectations

Economic indicators: a barometric method of forecasting designed to alert business to changes in conditions

- Leading, coincident, and lagging indicators
- Composite index: one indicator alone may not be very reliable, but a mix of leading indicators may be effective

Leading indicators predict future economic activity

- average hours, manufacturing
- initial claims for unemployment insurance
- manufacturers' new orders for consumer goods and materials
- vendor performance, slower deliveries diffusion index
- manufacturers' new orders, nondefense capital goods
- building permits, new private housing units
- stock prices, 500 common stocks
- money supply, M2
- interest rate spread, 10-year Treasury bonds minus federal funds
- index of consumer expectations

Coincident indicators identify trends in current economic activity

- employees on nonagricultural payrolls
- personal income less transfer payments
- industrial production
- manufacturing and trade sales

Lagging indicators confirm swings in past economic activity

- average duration of unemployment, weeks
- ratio, manufacturing and trade inventories to sales
- change in labor cost per unit of output, manufacturing (%)
- average prime rate charged by banks
- commercial and industrial loans outstanding
- ratio, consumer installment credit outstanding to personal income
- change in consumer price index for services

Economic indicators: drawbacks

- leading indicator index has forecast a recession when none ensued
- a change in the index does not indicate the precise size of the decline or increase
- the data are subject to revision in the ensuing months

Trend projections: a form of naïve forecasting that projects trends from past data without taking into consideration reasons for the change

- compound growth rate

- visual time series projections
- least squares time series projection

Compound growth rate: forecasting by projecting the average growth rate of the past into the future

- provides a relatively simple and timely forecast
- appropriate when the variable to be predicted increases at a constant %

General compound growth rate formula:

$$E = B(1+i)^n$$

E = final value
n = years in the series
B = beginning value
i = constant growth rate

Visual time series projections: plotting observations on a graph and viewing the shape of the data and any trends

Time series analysis: a naïve method of forecasting from past data by using least squares statistical methods to identify trends, cycles, seasonality and irregular movements

Time series analysis:

Advantages:

- easy to calculate
- does not require much judgment or analytical skill
- describes the best possible fit for past data
- usually reasonably reliable in the short run

Time series data can be represented as:

$$Y_t = f(T_t, C_t, S_t, R_t)$$

Y_t = actual value of the data at time t
T_t = trend component at t
C_t = cyclical component at t
S_t = seasonal component at t
R_t = random component at t

Time series components: **seasonality**

- need to identify and remove seasonal factors, using moving averages to isolate those factors
- remove seasonality by dividing data by seasonal factor
- Time series components: **trend**
- to remove trend line, use least squares method

- possible best-fit line styles:
  straight Line: $Y = a + b(t)$
  exponential Line: $Y = ab^t$
  quadratic Line: $Y = a + b(t) + c(t)^2$
  choose one with best R^2

Time series components: **cycle, noise**

- isolate cycle by smoothing with a moving average
- random factors cannot be predicted and should be ignored

Smoothing techniques (p. 158)

- moving average
- exponential smoothing

work best when:

- no strong trend in series
- infrequent changes in direction of series
- fluctuations are random rather than seasonal or cyclical

Moving average: average of actual past results used to forecast one period ahead

$$E_{t+1} = (X_t + X_{t-1} + \ldots + X_{t-N+1})/N$$

E_{t+1} = forecast for next period
X_t, X_{t-1} = actual values at their respective times
N = number of observations included in average

Exponential smoothing: allows for decreasing importance of information in the more distant past, through geometric progression

$$E_{t+1} = w \cdot X_t + (1-w) \cdot E_t$$

w = weight assigned to an actual observation at period t

Econometric models (p. 161): causal or explanatory models of forecasting

- regression analysis
- multiple equation systems
  - endogenous variables: dependent variables that may influence other dependent variables
  - exogenous variables: from outside the system, truly independent variables

    Example: econometric model
    Suits (1958) forecast demand for new automobiles
    $\Delta R = a_0 + a_1 \Delta Y + a_2 \Delta P/M + a_3 \Delta S + a_4 \Delta X$
    R = retail sales
    Y = real disposable income
    P = real retail price of cars

M = average credit terms
S = existing stock
X = dummy variable

Global Application: Forecasting Exchange Rates (p. 166)

Review Forecasting Exchange Rates on page 166 and consider the main points listed below:

- GDP
- interest rates
- inflation rates
- balance of payments

Activities

Chapter Five Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Two Discussion Question (Chapter Five):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

Compare the use of leading economic indicators, coincident economic indicators and lagging economic indicators.

(Note: Your instructor will post the question to the Week Two Weekly Discussion Question Forum)

CHAPTER SIX

The Theory and Estimation of Production

KEY LEARNING POINTS

The topics in this chapter represent the foundation for the economic analysis of supply. A firm's production function (input and resulting output) is discussed in addition to explaining the various forms of production functions, law of diminishing returns and the three states of production. As the authors explains, no matter how much revenue is generated by the marketing plan, if the cost of production cannot be contained, the company will not be able to earn an acceptable level of profit. In economics, the analysis of cost begins with the study of the production function (P. 187).

The Production Function (P. 187)

Defines the relationship between inputs and the maximum amount that can be produced within a given period of time with a given level of technology

$$Q=f(X_1, X_2, ..., X_k)$$

Q = level of output

$X_1, X_2, ..., X_k$ = inputs used in production

Key Assumptions:

- Given 'state of the art' production technology
- whatever input or input combinations are included in a particular function, the output resulting from their utilization is at the maximum level

For simplicity we will often consider a production function of two inputs:

Q=f(X, Y)

Q = output

X = labor

Y = capital

Short-run production function shows the maximum quantity of output that can be produced by a set of inputs, assuming the amount of at least one of the inputs used remains unchanged.

Long-run production function shows the maximum quantity of output that can be produced by a set of inputs, assuming the firm is free to vary the amount of all the inputs being used.

Ask yourself: What does the term Production Function refers to?

Short-run analysis of Total, Average, and Marginal Product (p. 189)

Alternative terms in reference to inputs

- 'inputs'
- 'factors'
- 'factors of production'
- 'resources'

Alternative terms in reference to outputs

- 'output'
- 'quantity' (Q)
- 'total product' (TP)
- 'product'

Marginal product (MP) = change in output (Total Product) resulting from a unit change in a variable input

$$MP_X = \frac{\Delta Q}{\Delta X}$$

Average product (AP) = Total Product per unit of input used

$$AP_X = \frac{Q}{X}$$

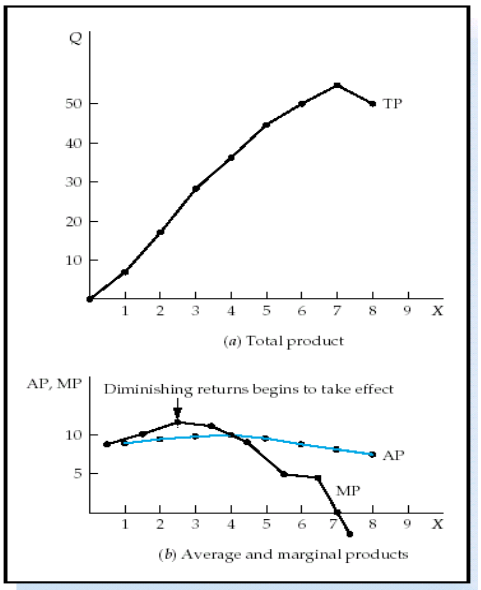


Figure 6.1 Short-Run Production with Y=2 (p190)

- if MP > AP then AP is rising
- if MP < AP then AP is falling

- MP=AP when AP is maximized
- **Law of diminishing returns**: as additional units of a variable input are combined with a fixed input, after some point the additional output (i.e., marginal product) starts to diminish
- nothing says *when* diminishing returns will start to take effect
- all inputs added to the production process have the same productivity

Ask Yourself: What is the law of diminishing return? Why this law is considered a short-run phenomenon?

The **Three Stages of Production** in the short run:

- Stage I: from zero units of the variable input to where AP is maximized (where MP=AP)
- Stage II: from the maximum AP to where MP=0
- Stage III: from where MP=0 on

In the short run, rational firms should be operating only in Stage II

- Q: Why not Stage III? → firm uses more variable inputs to produce less output
- Q: Why not Stage I? → underutilizing fixed capacity, so can increase output per unit by increasing the amount of the variable input

What level of input usage within Stage II is best for the firm? The answer depends upon:

- how many units of output the firm can
- sell the price of the product
- the monetary costs of employing the variable input

Total revenue product (TRP) = market value of the firm's output, computed by multiplying the total product by the market price

$TRP = Q \cdot P$

Marginal revenue product (MRP) = change in the firm's TRP resulting from a unit change in the number of inputs used

$MRP = MP \cdot P = \frac{\Delta TRP}{\Delta X}$

Total labor cost (TLC) = total cost of using the variable input labor, computed by multiplying the wage rate by the number of variable inputs employed

$TLC = w \cdot X$

Marginal labor cost (MLC) = change in total labor cost resulting from a unit change in the number of variable inputs used

MLC = w

Summary of relationship between demand for output and demand for a single input:

A profit-maximizing firm operating in perfectly competitive output and input markets will be using the optimal amount of an input at the point at which the monetary value of the input's marginal product is equal to the additional cost of using that input

MRP = MLC

Multiple variable inputs

Consider the relationship between the ratio of the marginal product of one input and its cost to the ratio of the marginal product of the other input(s) and their cost.

$$\frac{MP_1}{w_1} = \frac{MP_2}{w_2} = \frac{MP_k}{w_k}$$

Ask Yourself: What is the difference between a short-run and long-run production function?

Long-run Production Function (p. 199)

In the long run, a firm has enough time to change the amount of *all* its inputs. The long run production process is described by the concept of **returns to scale**
Returns to scale = the resulting increase in total output as all inputs increase
If all inputs into the production process are doubled, three things can happen:

- output can more than double
  - 'increasing returns to scale' (IRTS)
- output can exactly double
  - 'constant returns to scale' (CRTS)
- output can less than double
  - 'decreasing returns to scale' (DRTS)

One way to measure returns to scale is to use a coefficient of output elasticity:

if $E_Q > 1$ then IRTS
if $E_Q = 1$ then CRTS
if $E_Q < 1$ then DRTS

$$E_Q = \frac{\text{Percentage change in Q}}{\text{Percentage change in all inputs}}$$

Returns to scale can also be described using the following equation:

hQ = f(kX, kY)
if h > k then IRTS
if h = k then CRTS
if h < k then DRTS

Estimation of Production Function (p. 202)

Examples of production functions:

- short run: one fixed factor, one variable factor
  - $Q = f(L)_K$
- cubic: increasing marginal returns followed by decreasing marginal returns
  - $Q = a + bL + cL^2 – dL^3$
- quadratic: diminishing marginal returns but no Stage I
  - $Q = a + bL - cL^2$
- Power function: exponential for one input

$Q = aL^b$
if $b > 1$, MP increasing
if $b = 1$, MP constant
if $b < 1$, MP decreasing

Advantage: can be transformed into a linear (regression) equation when expressed in log terms

- Cobb-Douglas function: exponential for two inputs

$Q = aL^bK^c$
if $b + c > 1$, IRTS
if $b + c = 1$, CRTS
if $b + c < 1$, DRTS

Cobb-Douglas production function Advantages:

- can investigate MP of one factor holding others fixed
- elasticities of factors are equal to their exponents
- can be estimated by linear regression
- can accommodate any number of independent variables
- does not require constant technology

Shortcomings:

- cannot show MP going through all three stages in one specification
- cannot show a firm or industry passing through increasing, constant, and decreasing returns to scale
- specification of data to be used in empirical estimates
- Statistical estimation of production functions
- inputs should be measured as ‘flow’ rather than ‘stock’ variables, which is not always possible
- usually, the most important input is labor
- most difficult input variable is capital
- must choose between time series and cross-sectional analysis
- Aggregate production functions: whole industries or an economy
- gathering data for aggregate functions can be difficult:
- for an economy … GDP could be used
- for an industry … data from Census of Manufactures or production index from Federal Reserve Board

- for labor … data from Bureau of Labor Statistics

Ask Yourself: What are some of the problems of measuring productivity in actual work situation?

Importance of Production Function in Managerial Decision Making (p. 210)

Capacity planning: planning the amount of fixed inputs that will be used along with the variable inputs.

Good capacity planning requires:

- accurate forecasts of demand
- effective communication between the production and marketing functions

Example: cell phones

- Asian consumers want new phone every 6 months
- demand for 3G products
- Nokia, Samsung, Sony, Ericsson must be speedy and flexible

Example: Zara

- Spanish fashion retailer
- factories located close to stores
- quick response time of 2-4 weeks

Application: call centers

- service activity
- production function is
- Q = f(X,Y)
- where Q = number of calls
- X = variable inputs
- Y = fixed input

Application: China's workers

- is China running out of workers?
- industrial boom
- eg bicycle factory in Guangdong Provence

Activities

Chapter Six Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Two Discussion Question (Chapter Six):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to the ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **How would you choose to estimate a production function for a single plant? How would you choose to estimate a production function for a number of firms in an industry? Explain.**

(Note: Your instructor will post the question to the Week Two Weekly Discussion Question Forum)

UNIT TWO ASSIGNMENTS

Unit Two Exam

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Unit Two Case Analysis

Read International Application: Is China Running out of Workers? (p. 216)

Write a 3 to 5 page paper (1000 to 1500 words) in APA format as follow:

a) Statement of the Problem - Discuss the issues identified and the ramification
b) Proposing a solution - Use some key concepts and models proposed in this unit.
c) Learning Application - Summarize what an outside reader can take away from having read your analysis Cite source with in-text citations.

Below is a recommended outline.

1. Cover page (See APA Sample paper)

2. Introduction

    a) A thesis statement
    b) Purpose of paper
    c) Overview of paper

3. Body

    a) Statement of the Problem - Discuss the issues identified and the ramification
    b) Proposing a solution - Use some key concepts and models proposed in this unit.
    c) Learning Application – Summarize what an outside reader can take away from having read your analysis. Cite source with in-text citations.

4. Conclusion – Summary of main points and recommendations

5. References – List the references you cited in the text of your paper according to APA format.

(Note: Do not include references that are not cited in the text of your paper)

GRADING

Please see the Instructor Syllabus and Policies for details on grading of this assignment.

UNIT THREE

Chapters & Learning Outcomes

The key points of the following chapters (see textbook) will be discussed in this Unit:

- Chapter Seven
  The Theory and Estimation of Cost pages 252 to 308

UNIT THREE LEARNING OUTCOMES

This Unit meets the following learning outcomes:

LO 29. Define the cost function and explain the difference between a short-run and a long-run cost function.
LO 30. Explain the linkages between the production function and the cost function.
LO 31. Distinguish between economic cost and accounting cost.
LO 32. Explain how the concept of relevant cost is used in the economic analysis of cost.
LO 33. Define short-run total cost, short-run total variable cost, and total fixed cost and explain their relationship to each other.
LO 34. Define average cost, average variable cost, and average fixed cost and explain their relationship to each other in the short run. Do the same for average cost and average variable cost in the long run.
LO 35. Compare and contrast the short-run cost function and the long-run cost function and explain why economies of scale is considered to be a long-run phenomenon.

CHAPTER SEVEN

The Theory and Estimation of Cost

KEY LEARNING POINTS

Chapter 7 states accounting data have generally been used to investigate short-run and long-run cost functions. Economic and Accounting definitions of costs can differ substantially and presents the researcher with a host of problems. Depending on how the data are collected, adjustments for price, changes, geographic differentials, and other variations must be made. This chapter discusses the use of cost, production and cost, short run and long run cost, economics of scope and scale, supply chain management and ways companies have cut costs to remain competitive.

The Importance of cost in Managerial Decisions (p. 253)

Ways to contain or cut costs popular during the past decade

- most common: reduce number of people on the payroll
- outsourcing components of the business
- merge, consolidate, then reduce headcount

Definition and use of Cost in Economic Analysis (p. 255)

- Relevant cost: a cost that is affected by a management decision
- Historical cost: cost incurred at the time of procurement
- Opportunity cost: amount or subjective value that is forgone in choosing one activity over the next best alternative
- Incremental cost: varies with the range of options available in the decision
- Sunk cost: does not vary in accordance with decision alternatives

Ask yourself: Can you name one relevant cost?

Relationship between Production and Cost (p. 257)

Cost function is simply the production function expressed in monetary rather than physical units. We assume the firm is a 'price taker' in the input market

- **Total variable cost** (TVC) = the cost associated with the variable input, found by multiplying the number of units by the unit price
- **Marginal cost** (MC) = the rate of change in total variable cost

The law of diminishing returns (Chapter 6) implies that MC will eventually increase

$$MC = \frac{\Delta TVC}{\Delta Q} = \frac{W}{MP}$$

Plotting TP and TVC illustrates that they are mirror images of each other. When TP increases at an increasing rate, TVC increases at a decreasing rate

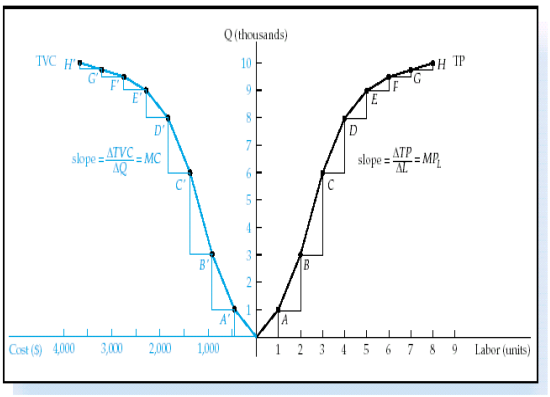


Figure 8.1
Short-Run Production and Cost

Short-run Cost Function (p. 259)

For simplicity use the following assumptions:

- the firm employs two inputs, labor and capital
- the firm operates in a short-run production period where labor is variable, capital is fixed
- the firm produces a single product
- the firm employs a fixed level of technology
- the firm operates at every level of output in the most efficient way
- the firm operates in perfectly competitive input markets and must pay for its inputs at a given market rate (it is a 'price taker')
- the short-run production function is affected by the law of diminishing returns
- Short-run cost function

Standard variables in the short-run cost function:

- Quantity (Q) is the amount of output that a firm can produce in the short run
- Total fixed cost (TFC) is the total cost of using the fixed input, capital (K)

Standard variables in the short-run cost function:

- Total variable cost (TVC) is the total cost of using the variable input, labor (L)
- Total cost (TC) is the total cost of using all the firm's inputs,
- TC = TFC + TVC

Standard variables in the short-run cost function:

- Average fixed cost (AFC) is the average per-unit cost of using the fixed input K
  AFC = TFC/Q
- Average variable cost (AVC) is the average per-unit cost of using the variable input L
  AVC = TVC/Q

Standard variables in the short-run cost function:

- Average total cost (AC) is the average per-unit cost of all the firm's inputs
  AC = AFC + AVC = TC/Q
- Marginal cost (MC) is the change in a firm's total cost (or total variable cost) resulting from a unit change in output
  MC = ΔTC/ΔQ = ΔTVC/ΔQ

For a graphical example of the cost variables see page 261.

Important observations:

AFC declines steadily

- when MC = AVC, AVC is at a minimum
- when MC < AVC, AVC is falling
- when MC > AVC, AVC is rising

The same three rules apply for average cost (AC) as for AVC

A reduction in the firm's fixed cost would cause the average cost line to shift downward.

A reduction in the firm's variable cost would cause all three cost lines (AC, AVC, MC) to shift.

Alternative specifications of the Total Cost function (relating total cost and output)

- cubic relationship
  as output increases, total cost first increases at a decreasing rate, then increases at an increasing rate.

Alternative specifications of the Total Cost function (relating total cost and output)

- quadratic relationship
  as output increases, total cost increases at an increasing rate
- linear relationship
  as output increases, total cost increases at a constant rate

Ask yourself: Changes in the Short-run total costs result from changes in which cost?

Long-run Cost Function (p. 264)

In the long run, all inputs to a firm's production function may be changed

- because there are no fixed inputs, there are no fixed costs

- the firm's long run marginal cost pertains to returns to scale
- at first increasing returns to scale, then as firms mature they achieve constant returns, then ultimately decreasing returns to scale

When a firm experiences increasing returns to scale:

- a proportional increase in all inputs increases output by a greater proportion
- as output increases by some percentage, total cost of production increases by some lesser percentage

Economies of scale: situation where a firm's long-run average cost (LRAC) declines as output increases. **Diseconomies of scale**: situation where a firm's LRAC increases as output increases. In general, the **LRAC curve** is u-shaped.

Reasons for long-run economies:

- specialization of labor and capital
- prices of inputs may fall with volume discounts in firm's purchasing
- use of capital equipment with better price-performance ratios
- larger firms may be able to raise funds in capital markets at a lower cost
- larger firms may be able to spread out promotional costs
- Long-run cost function

Reasons for diseconomies of scale

- scale of production becomes so large that it affects the total market demand for inputs, so input prices rise
- transportation costs tend to rise as production grows, due to handling expenses, insurance, security, and inventory costs
- Long-run cost function

Review Figure 7.9 Capacity level and Short-Run Average Cost.

- In long run, the firm can choose any level of capacity
- Once it commits to a level of capacity, at least one of the inputs must be fixed. This then becomes a short-run problem
- The LRAC curve is an envelope of SRAC curves, and outlines the lowest per-unit costs the firm will incur over a range of output

Learning Curve (p. 273)

Learning curve: line showing the relationship between labor cost and additional units of output. Downward slope indicates additional cost per unit declines as the level of output increases because workers improve with practice

Learning curve:

- measured in terms of percentage decrease in additional labor cost as output doubles
  $Y_x = Kx^n$
  Y_x = units of factor or cost to produce the xth unit
  K = factor units or cost to produce the Kth (usually first) unit
  x = product unit (the xth unit)
  n = log S/log 2
  S = slope parameter

Economies of Scope (p. 276)

Economies of scope: reduction of a firm's unit cost by producing two or more goods or services jointly rather than separately. This is closely related to economies of scale.

Supply Chain Management (p. 277)

Supply chain management (SCM): efforts by a firm to improve efficiencies through each link of a firm's supply chain from supplier to customer

- transaction costs are incurred by using resources outside the firm
- coordination costs arise because of uncertainty and complexity of tasks
- information costs arise to properly coordinate activities between the firm and its suppliers

Ways to develop better supplier relationships

- strategic alliance: firm and outside supplier join together in some sharing of resources
- competitive tension: firm uses two or more suppliers, thereby helping the firm keep its purchase prices under control

Ways Companies cut Costs to Remain Competitive (p. 280)

- the strategic use of cost
- reduction in cost of materials
- using information technology to reduce costs
- reduction of process costs
- relocation to lower-wage countries or regions
- mergers, consolidation, and subsequent downsizing
- layoffs and plant closings

Global Application: Manufacturing Chemicals in China (p. 286)

Review Manufacturing Chemicals in China, and consider the following:

- labor content relatively low

- high use of equipment and raw materials
- noncost reasons for outsourcing

Activities

Chapter Seven Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the Week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Three Discussion Question (Chapter Seven):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **You have opened your own word-processing service. You bought a personal computer, and paid $5,000 for it. However, due to the cost changes in the computer industry, the current price of an equivalent machine is $2,500. You could sell any used machine for $1,000. If you were not word processing, you could earn $20,000 per year at an alternative job. Assume that the interest rate is 10%. You can also hire an assistant who can do everything that you can do for $20,000 per year (you would still continue to do word processing).**
>
> **One person using one computer can produce 11,000 typed pages per year, and the price per page for your service is $2.**
>
> **You are considering three options: (1) expand your business by hiring an assistant. (2) leave your business the way it is (3) shut down. Based on the costs and revenues above, which should you do? Explain and show any relevant calculations.**

(Note: Your instructor will post the question to the Week Three Weekly Discussion Question Forum)

UNIT THREE ASSIGNMENTS

Unit Three Exam

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Unit Three Case Analysis

Review the case on page 252 regarding Shayna Soda Company.

Write a 3 to 5 page paper (1000 to 1500 words) in APA format that includes the following:

a) Statement of the Problem - Discuss the issues identified and the ramification
b) Proposing a solution - Use some key concepts and models proposed in this unit.
c) Learning Application - Summarize what an outside reader can take away from having read your analysis Cite source with in-text citations.

Below is a recommended outline.

1. Cover page (See APA Sample paper)
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4. Conclusion – Summary of main points and recommendations
5. References – List the references you cited in the text of your paper according to APA format.

(Note: Do not include references that are not cited in the text of your paper)

GRADING

Your instructor will provide a grading rubric to evaluate your paper. Please see the Instructor Syllabus and Policies for details.

UNIT FOUR

Chapters & Learning Outcomes

The key points of the following chapters (see textbook) will be discussed in this Unit:

- Chapter Twelve
  Capital Budgeting and Risk pages 450 to 496

UNIT FOUR LEARNING OUTCOMES

This Unit meets the following learning outcomes:

LO 36. Identify the types of capital budgeting decisions.
LO 37. Show how to calculate the net present value and the internal rate of return, and understand the difference between the two.
LO 38. Identify different types of cash flows, and explain how they fit into the capital budgeting calculation.
LO 39. Define the cost of capital, and demonstrate how it is calculated.
LO 40. Explain the meaning of the capital budgeting model.
LO 41. Define capital rationing.
LO 42. Define risk and uncertainty.
LO 43. Describe and calculate various measures of risk, such as the expected value, standard deviation, and coefficient of variation.
LO 44. Explain the meaning of the risk-adjusted discount rate and certainty equivalents.
LO 45. Distinguish between sensitivity analysis and scenario analysis.
LO 46. Describe how to calculate simulations and decision trees.
LO 47. Explain how real options can improve capital budgeting calculations.

CHAPTER TWELVE

Capital Budgeting and Risk

KEY LEARNING POINTS

This chapter discusses Capital budgeting which involves the evaluation of projects in which initial expenditures provide streams of cash inflows over a significant period of time. The important lesson of this chapter is that risk is ever present in business, and anyone engaging in business planning must be aware of the dangers of risky outcomes and be able to cope with the uncertainty of future events.

Capital Budgeting Decision (p. 452)

Capital budgeting: describes decisions where expenditures and receipts for a particular undertaking will continue over a period of time. Capital decisions usually involve outflows of funds in the early periods while the inflows start somewhat later and continue for a significant number of periods.

Types of capital budgeting decisions

- expansion of facilities
- new or improved products
- replacement
- lease or buy
- make or buy
- safety or environmental protection equipment

Ask yourself: The term "capital budgeting" refers to what decisions?

Time Value of Money (p. 453)

Time value of money: a dollar today is worth more than a dollar tomorrow.

To put cash flows originating at different times on an equal basis, we must apply an interest rate to each of the flows so that they are expressed in terms of the same point in time.

Ask yourself: If $1,000 is placed in an account earning 8% annually, can you calculate what the balance will be at the end of seven years?

Methods of Capital Projection Evaluation (p. 453)

Payback: time period (years) necessary to recover the original investment.

Accounting rate of return: percentage resulting from dividing average annual profits by average investment

Methods that **discount** cash flows to a present value

1. internal rate of return (IRR)
2. net present value (NPV)
3. profitability index (PI)
4. Methods of capital project evaluation

Net Present Value formula:

t = time period
n = last period of project
R_t = cash inflow in period t
O_t = cash outflow in period t
k = discount rate (cost of capital)
Methods of capital
project evaluation

$$NPV = \sum_{t=1}^{n} \frac{R_t}{(1+k)^t} - \sum_{t=0}^{n} \frac{O_t}{(1+k)^t}$$

if NPV evaluates to a positive number, the project is financially acceptable. If it is negative, rejection is indicated

Discount rate (k): the interest rate used to evaluate the project. Also called the cost of capital, hurdle rate, cut-off rate, minimum required rate of return

The **internal rate of return** of a project is the discount rate that causes NPV to equal zero. Formula:

$$\sum_{t=1}^{n} \frac{R_t}{(1+r)^t} = \sum_{t=0}^{n} \frac{O_t}{(1+r)^t}$$

If the IRR is larger than the cost of capital it signals acceptance. If the IRR is less than the cost of capital the proposed project should be rejected.

For single projects IRR and NPV will give the same results:

- NPV > 0, IRR > k
- NPV = 0, IRR = k
- NPV < 0, IRR < k

If multiple projects are being considered, IRR and NPV will give the same results if the projects are independent

- projects can be implemented simultaneously
- one project will not affect the cash flow of another

IRR and NPV methods may yield different results if mutually exclusive projects are analyzed and if:

- the initial costs of the proposals differ
- the shapes of the cash inflow streams differ

A problem with IRR is uneven cash flows

NPV is most recommended measure of a project

Profitability index

PI = (PV of cash flows)/(Initial investment)

Cash Flows (p. 459)

The analyst's most difficult task is to enter the best estimates of cash flows into the analysis

- future timing and amount of cash flows are uncertain
- data from organizational entities have to be examined for potential bias
    - market forecasts may be biased upward
    - costs are often underestimated

Guidelines for analyzing cash flows:

- all revenue and costs must be stated in terms of cash flows
- all cash flows should be incremental
- sunk costs do not count
- any effect on other parts of the operation must be taken into account
- interest paid on debt is not considered

Types of cash flows

- Initial cash outflows: payments that occur at the inception of the project
- Operating cash flows: revenues, costs, and expenses generated by the project
- Additional working capital: inventories, accounts receivable, cash needed for growth that are recovered at the end of the project
- Salvage or resale values: expected sales value of project machinery at end of project
- Noncash investment: e.g . use of an existing machine that is not used

Cost of Capital (p. 461)

Debt finance

- short-term
- long-term

Equity finance

- new equity
- retained earnings

Cost of debt = r · (1 – t)

- r = present interest rate charged for the kind of debt the company would issue
- t = tax rate (interest expense is tax deductible)

Equity: retained earnings

$$k_e = \frac{D_1}{P_0} + g$$

k_e = cost of equity capital
D_1 = dividend, next period
P_0 = current stock price
g = rate at which dividend is expected to grow

Equity: new raisings

$$k_e = \frac{D_1}{P_0(1-f)} + g$$

ke = cost of equity capital
D1 = dividend, next period
P0 = current stock price
g = rate at which dividend is expected to grow
f = flotation costs (as % of P0)

Capital Asset Pricing Model (CAPM)

$k_j = R_f + \beta(k_m - R_f)$
k_j = required rate of return on stock j
R_f = risk-free rate
k_m = rate of return on the market portfolio
β = volatility of a stock's returns relative to the return on a total stock market portfolio

Weighted average cost of capital (WACC): the average of the cost of debt financing and the cost of equity financing, weighted by their proportions in the total capital structure at market values. There is a point where the combination of components (debt, equity) is optimal and WACC is at a minimum

The Capital Budgeting Model (p. 464)

Marginal investment opportunity curve: a curve representing the internal rate of return on successive doses of investment.

Marginal cost of capital: cost of capital required for each additional project, typically rising after the capital budget of a certain size is reached.

Optimal investment budget: is where the marginal investment opportunity curve intersects the marginal cost of capital curve.

Capital Rationing (p. 466)

Capital rationing: the practice of restricting capital expenditures to a certain amount due to:

- reluctance to incur increasing levels of debt
- perhaps due to limits on external financing
- management may not want to add to equity in fear of diluting control

Implication: capital rationing does not permit a company to achieve its maximum value

Risk versus Uncertainty (P. 466)

Risk refers to a situation in which possible future events can have probabilities assigned. Probabilities can be:

- *a priori* – obtained by repetition or based on general mathematical principles
- statistical – empirical, based on past events

Uncertainty refers to situations in which there is no viable method of assigning probabilities to future random events

Sources of Business Risk (P. 467)

- economic conditions
- fluctuations in specific industries
- competition and technological change
- changes in consumer preferences
- costs and expenses (materials, services, labor)

Measures of Risk (p. 467)

Probability: an expression of the chance that a particular event will occur. A probability distribution describes, in percentage terms, the chances of all possible occurrences. The probabilities of all possible events sum to 1

Expected value: the average of all possible outcomes weighted by their respective probabilities

R = expected value
p_i = probability of case i
n = number of possible outcomes
R_i = value in case i

$$\overline{R} = \sum_{i=1}^{n} R_i p_i$$

Standard deviation reflects the variation of possible outcomes from the average. Calculated as the square root of the weighted average of the squared deviations of all possible outcomes from the expected value:

$$\sigma = \sqrt{\sum_{i=1}^{n} \left(R_i - \overline{R}\right)^2 p_i}$$

Based on statistical theory describing the normal curve:

- 34% of possible occurrences will be within 1 standard deviation of the mean
- 47.4% will be within 2 standard deviations
- 49.9% will be within 3 standard deviations

To determine the probability of an event given a normal distribution, find the Z value look up the Z-value in a table to find the appropriate probability

$$Z = \frac{X - \bar{R}}{\sigma}$$

Z = number of standard deviations from the mean
X = variable (value) in which we are interested

Coefficient of variation: a measure of risk relative to expected value. CV is used to compare standard deviations or projects with unequal expected values.

$$CV = \sigma / \bar{R}$$

σ = standard deviation
R = expected value

Capital Budgeting Under Conditions of Risk (p. 472)

To incorporate risk into a capital budgeting problem:

- calculate expected NPV
- calculate the standard deviation of NPV

Net Present Value of expected values

$$\overline{\mathrm{NPV}} = \sum_{t=1}^{n} \frac{\bar{R}_t}{(1+r_f)^t} - O_0$$

NPV = expected net present value

O_0 = initial investment
r_f = risk-free interest rate
R_t = expected value of annual cash flows

Standard Deviation of the present value

$$\sigma = \sqrt{\sum_{i=1}^{n} \frac{\sigma_t^2}{(1+r_f)^{2t}}}$$

σ = standard deviation of NPV
σ_t = standard deviation of cash flow in period t

Ask yourself: When does the internal rate of return equal the cost of capital?

Two Other Methods for Incorporating Risk (p. 473)

1. **Risk-adjusted discount rate** (RADR): the risk adjustment is made in the denominator of the present-value calculation

   $K = r_f + RP$
   K = risk adjusted discount rate
   r_f = risk-free rate (short-term U.S. Treasury Securities)
   RP = risk premium

2. **Certainty equivalent**: a certain (risk-free) cash flow that would be acceptable as opposed to the expected value of a risky cash flow. With the certainty equivalent method, the risk adjustment is made in the numerator of the present-value calculation

Sensitivity and Scenario Analysis (p. 475)

Sensitivity analysis: a method for estimating project risk that involves changing a key variable to evaluate the impact the change will have on the results.

Scenario analysis: similar to sensitivity analysis, but takes into consideration the changes of several important variables simultaneously

Simulation (p. 476)

Simulation analysis: a method for estimating project risk that assigns a probability distribution to each of the key variables. It uses random numbers to simulate a set of possible outcomes to arrive at an expected value and dispersion.

Steps in simulation analysis:

- assign probability distributions to each of the key variables
- generate a random number for each of the key variables
- calculate NPV based on the assigned probability distribution and the random numbers generated
- repeat a large number of times (1000 or more)
- use the trials to form a frequency distribution of NPVx
- calculate a standard deviation and Z-statistic

Decision Trees (p. 477)

Decision tree: a diagram points out graphically the order in which decisions must be made and compares the value of the various actions that can be undertaken. Decision points are designated with squares on a decision tree. Chance events are designated with circles and are assigned certain probabilities.

Steps in using a decision tree:

- set up all the branches of the decision tree
- move back from right to left, calculating the expected value of each branch
- where appropriate, combine or eliminate branches
- eliminate branches corresponding to poor decisions
- compare the net expected value of the final remaining alternatives to arrive at a solution

Example: suppose a company can purchase the patent for manufacture of a new product for $200,000. It has three choices:

- does not purchase
- purchases at the above price
- spends an extra $50,000 on a feasibility study before purchase

→ Develop a decision tree and compare the value of the various actions.

Ask yourself: What is the advantage of the decision tree?

Real Options in Capital Budgeting (p. 479)

Real option: an opportunity to make changes in some aspects of the project while it is in progress or to make adjustments even before the project is started.

Value of the project = NPV + option value

Forms of real options:

- option to vary output
- option to vary inputs – flexibility
- option to abandon
- option to postpone
- option to introduce future products

Global Application: Political Risk (p. 482)

Review Political Risk on page 482 and consider the following:

- regulation risk

- discrimination risk
- expropriation risk
- war risk

Activities

Chapter Twelve Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Four Discussion Question (Chapter Twelve):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to the ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **You deposit $10,000 in a savings account today, and if the interest rate is 3%, what is the value in 20 years?**

(Note: Your instructor will post the question to the Week Four Weekly Discussion Question Forum)

UNIT FOUR ASSIGNMENTS

Unit Four Exam

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Unit Four Case Analysis

Review the Situation (Global Foods) on page 450.

Write a 3 to 5 page paper (1000 to 1500 words) in APA format that includes the following:

a) Statement of the Problem - Discuss the issues identified and the ramification
b) Proposing a solution - Use some key concepts and models proposed in this unit.
c) Learning Application - Summarize what an outside reader can take away from having read your analysis Cite source with in-text citations.

Below is a recommended outline.

1. Cover page (See APA Sample paper)
2. Introduction
    a. A thesis statement
    b. Purpose of paper
    c. Overview of paper
3. Body
    a. Statement of the Problem - Discuss the issues identified and the ramification
    b. Proposing a solution - Use some key concepts and models proposed in this unit
    c. Learning Application - Summarize what an outside reader can take away from having read your analysis Cite source with in-text citations.
4. Conclusion – Summary of main points and recommendations
5. References – List the references you cited in the text of your paper according to APA format.

(Note: Do not include references that are not cited in the text of your paper)

GRADING

Your instructor will provide a grading rubric to evaluate your paper. Please see the Instructor Syllabus and Policies for details.

UNIT FIVE

Chapters & Learning Outcomes

The key points of the following chapters (see textbook) will be discussed in this Unit:

- Chapter Fourteen	
Government and Industry	pages 520 to 541
- Chapter Fifteen	
Managerial Economics in Action	pages 542 to 570

CHAPTER FOURTEEN

UNIT FIVE LEARNING OUTCOMES

This Unit meets the following learning outcomes:

LO 57. Cite the five major functions of government in a market economy.
LO 58. Explain the reasoning of the Course theorem in its contention that government involvement may not be necessary to deal with market externalities.
LO 59. Explain why firms merge and why, in particular, firms have chosen to merge in markets that have experienced government deregulation.
LO 60. Briefly explain the process that a private firm must follow in securing a government contract.
LO 61. Describe the market structure of the beverage industry and cite the main factors that affect the degree of competitiveness in this industry.
LO 62. Cite specific ways that the activities in the beverage industry illustrate the major economic concepts presented in this text (e.g., supply and demand, cost function, production function, forecasting).
LO 63. Cite ways that the activities involved in creating an annual plan in the beverage industry illustrate the major economic concepts presented in this text.
LO 64. Describe the "changing economics" of the soft drink industry and explain how Coca-Cola, Inc. and PepsiCo, Inc. have adjusted their strategy in the beverage market accordingly.

CHAPTER FOURTEEN

Government and Industry (Pages 520 to 541)

KEY LEARNING POINTS

Previous chapters identify how managers can equip themselves with an understanding of the major factors of the market process such as supplies, demand, production, cost and competition. In addition, it offers quantitative tools of analysis to assist in making optimal decisions to help their firms maximize economic profit. This chapter focuses on governmental involvement and that managers must take governmental involvement into account when making optimal decisions as there are governmental laws and regulations that can reduce a firm's profits. The government can also be a major customer from which businesses can profit.

Governmental Involvement in a Market Economy (p. 521)

Functions of government in a market economy:

- provide legal and social framework
- maintain competition in markets by ensuring no one seller dominates
- redistribution of income and wealth
- reallocation of resources
- stabilization of the aggregate economy
- regulation of natural monopolies

Antitrust laws: legal framework for competition:

- Sherman Anti-Trust Act (1890)
- Clayton Act (1914)
- Federal Trade Commission Act (1914)
- Robinson-Patman Act (1936)
- Celler-Kefauver Act (1950)
- Hart-Scott-Rodino Act (1976)

The purpose of antitrust laws:

- economic efficiency
- limit power of large firms and protect smaller firms

Case study: Microsoft fined by European Commission in 2004, but debate surrounds the decision

Externalities:

Under perfect competition resources are efficiently allocated and social welfare is maximized, but market externalities can cause efficiency failure and welfare loss.

- benefit externality: certain benefits accrue to third parties free of charge → producers cannot recover all the revenue due, so too little may be produced.
- cost externality: producer does not pay all the costs generated by the product (eg pollution) → the product's price will be lower than if it had included all cost, thus too much will be produced

Ask yourself: What is an example of a product or service that provides a benefit externality?

Socially Optimal Price

Socially optimal price occurs where the price of the product equals the marginal social cost. At this point, less pollution will be produced than under competitive conditions. Social cost = sum of the MC of the product and the MC of externalities (such as pollution)

How can the optimal equilibrium be attained?

- government can restrict production (eg can set maximum pollution levels for the industry then sell tradable pollution licenses)
- government can impose a pollution tax

Coase Theorem:

Government intervention to eliminate the effect of externalities is not necessary if property rights (eg pollution permits) are assigned → bargaining between the parties involved would result in an optimal solution.

Limitations of Coase theorem:

- normative issues
- transaction costs
- unfair bargaining
- incomplete information
- Stabilization of the aggregate economy

Ask yourself: According to Coase theorem, how can an optimal equilibrium be obtained in the presence of cost externalities?

Stabilization of the Aggregate Economy (p. 527)

Monetary Policy: The monetary policy controls the quantity of money in the economy and/or interest rates by the Federal Reserve.

Fiscal Policy: Fiscal Policy relates to changes in the level of taxation and government spending.

Policy aims to influence macroeconomic variables such as inflation, output (GDP) and employment

Lags in the effect of the policy:

- recognition of a problem
- implementation of the policy
- realization of benefits in the economy

Doing Business with the U.S. Government (p. 529)

Monopsony: a market in which there is only one buyer

Example: the government procurement office is often cited as a good example of a monopsony

What influences government purchases:

- government strategic plans
- budget and program input from federal departments
- priorities set by the President
- availability of appropriated funds
- congressionally mandated requirements
- surplus/deficit conditions
- politics

Government acquisition is controlled by:

- Armed Services Procurement Act
  Army, Navy, Air Force, Coast Guard, NASA
- Federal Property and Administrative Act
  General Services Administration and all other agencies
- Companies doing business with the government must comply with:
  - competition requirements
  - profit restrictions
  - audits
  - bid protest rules
  - accounting requirements
  - socioeconomic Programs

Federal acquisition reforms of the 1990s

- Federal Supply Schedules:
  - qualified vendors can market their services to federal agencies
  - federal agencies can find vendors on the list
- Government has created 'franchises' and employee stock option plans (ESOP)

- Government and private companies bid against each other to provide services

Government Deregulation Mergers and Acquisitions (p. 534)

Deregulation has resulted in more competitive environment and many companies have sought to merge with other firms in order to survive and grow. From the late 1970's government deregulated industries such as:

- telecommunications
- electric and gas utilities
- airlines
- commercial banks

The basic motivation for mergers is to increase the value of the combined firms compared with their separate valuations

$V_{A+B} > (V_A + V_B)$
V = total market value
A & B = companies involved
Incentives to merge

- synergies in production
  - revenue enhancements
  - operating economies
  - financial economies
- improved management
- tax consequences
- managerial power
- diversification
- market power

Results of studies of effects of mergers on stockholders and the economy

- stockholders of the target firm gain substantially
- stockholders of the acquiring firm gain very little
- evidence regarding increased profitability of merged firms is mixed
- no increase in the level of industry concentration
- no decrease in research and development activity of merged firms

Factors that are instrumental in enhancing value of a merger or acquisition

- expected synergies
- mergers that look for value
- restructuring that includes divestitures of underperforming businesses
- tender offers (as compared to friendly mergers)

Factors that do not create value

- glamour acquisitions (based on book-to-market ratios)
- mergers to build market power
- mergers to use excess cash

Ask yourself: Which organization is responsible for controlling the money supply?

Global Application: The Failed Attempt to Merge by General Electric and Honeywell (p. 539)

Review General Electric merger attempt with Honeywell and consider the following:

- failed merger attempt in 2001
- two different philosophies by American regulators (approved the merger) and European regulators (ruled against)
- US favors the demand side
- Europe favors the supply side

Activities

Chapter Fourteen Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Five Discussion Question (Chapter Fourteen):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **A function of government is to regulate "natural monopolies." Explain what a natural monopoly is. Why does a natural monopoly require government regulation?**

(Note: Your instructor will post the question to the Week Five Weekly Discussion Question Forum)

CHAPTER FIFTEEN

Managerial Economics in Action

KEY LEARNING POINTS

This chapter discusses a case study of the food and beverage industry. It discusses the industry background, industry analysis and demonstrates managerial decision making in action. As you read through this chapter, you will see terms you have discovered throughout the course such as supply, demand, cost management, supply chain management, changing consumer tastes and preferences, price competition, rising costs of inputs, strategic focus on different market segments.

Introduction (p. 542)

Review (from chapter 1): Questions Managers Must Answer (p. 543):

- what are the economic conditions in our particular market?
- should our firm be in this business?
- if so, at what price and output levels?
- how can we maintain a competitive advantage over other firms?
- what are the risks involved?

Economic Overview of the Industry (p. 544)

Food and beverage: **industry trends**

- wellness and nutrition
    - firms introducing healthier offerings
    - firms adjusting to changing consumer preferences
    - aging population
    - new elements (eg vitamin fortification, antioxidants)
    - reduced fat, sodium, sugar

Food and beverage: industry trends

- input prices are rising
    - grain prices up, partly offset by larger acreage
    - input price rises running ahead of retail rises

Food and beverage: industry trends

- restructuring programs implemented
    - plant closings
    - supply chain improvements

Food and beverage: industry trends

- focus on functional foods
  - nutraceuticals
  - growing overlap between food/beverage, health care, and cosmetics industries

Food and beverage: industry trends

- jump in organic food sales
  - consumers concerned about how food is grown
  - less antibiotics, growth hormones, pesticides

Food and beverage: industry trends

- localvores
  - growing interest in locally produced products
- changing population mix
  - food tastes influenced by demographics
  - Hispanic/Asian/Muslim

Food and beverage: industry trends

concerns about food environment
product recalls raise doubts about food safety
regulation of imports
companies look overseas for growth
Asia, China
Europe, Russia
US agricultural trade on the rise
Food and beverage: industry trends
changing consumer preferences
decline of CSDs
rise of alternative drinks

Ask yourself: Why is the demand in the refreshment beverage market changing?

Beverage Industry: Analysis (p. 552)

Industry overview:

- Americans spend $100 billion on refreshment beverages per year
- industry is relatively mature
- grow by acquisition or innovation
- industry talk: 'share of stomach'

Carbonated soft drinks (CSDs):

- traditionally dominant
- recently challenged by bottled water
- diet soft is important segment

Bottled water:

- second largest segment
- strong growth
- new product is 'enhanced water'

Manufacturing and distribution:

- three basic forms of output in the industry
- concentrates
- syrups
- finished products
- production involves a two-tier process

Competition:

- industry is characterized by monopolistic competition
- CSD segment is more like oligopoly

Consumer demand:

- does the market need so many different products?
- tastes and preferences are changing
  - health concerns
  - lifestyle
  - work patterns

Ask yourself: Do you feel the demand for organically grown food is increasing?

Managerial Decision Making in Action: Spritz Soda (p. 558 to p562)

Historical results and lessons learned

- the brand's current situation
- key factors affecting Spritz's growth

SWOT analysis

- strengths
  - strong share position
  - strong brand awareness
  - potentially high profit margin
- weaknesses
  - slow decline among younger consumers
  - loss of distribution in some convenience stores
  - declining gross profit margin due to inefficiencies
- opportunities
  - room for new entrants in new drink markets
  - growing consumer interest in wellness
  - regain distribution in a convenience channel
- threats
  - new products are sourcing volume from the CSD segment
- Goals and objectives
  - profitable growth

- Strategies, tactics and measures
    - based on research, interviews, consultants, own experience
    - brand extension into growth segment
    - launch a premium 'white soda' high-energy drink
- Key measures to monitor performance
    - attain profitable growth by third year of plan
    - achieve annual revenue growth of 4-5%
- Risks and opportunities
    - would consumers accept a non-cola as an energy drink?
    - should Global Foods divest itself of Spritz? (to allow better focus on beverages)

Activities

Chapter Fifteen Practice Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week Five Discussion Question (Chapter Fifteen):

The purpose of the discussion question is to allow you as the Learner to demonstrate your understanding of the chapter's key learning points and how you might apply them in given situation. Participating in the discussion question forum provides you as the Learner an opportunity to compare your ideas to the ideas from others in your class.

Instructions: Using the chapter's key learning points, provide your answer to the question below.

> **What are the main factors driving the food companies to change their product lines in the beverage industry and how has the industry responded?**

(Note: Your instructor will post the question to the Week Five Weekly Discussion Question Forum)

UNIT FIVE ASSIGNMENTS

Unit Five Exam

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Unit Five Case Analysis

Read the CASE ANALYSIS in page 542 Under "The Situation" "Spritz Soda's Annual Business Plan".

Write a 3 to 5 page paper (1000 to 1500 words) in APA format that includes the following:

a) Statement of the Problem - Discuss the issues identified and the ramification
b) Proposing a solution - Use some key concepts and models proposed in this unit
c) Learning Application - Summarize what an outside reader can take away from having read your analysis Cite source with in-text citations

Below is a recommended outline.

1. Cover page (See APA Sample paper)
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    c. Learning Application - Summarize what an outside reader can take away from having read your analysis Cite source with in-text citations.
4. Conclusion – Summary of main points and recommendations
5. References – List the references you cited in the text of your paper according to APA format.

(Note: Do not include references that are not cited in the text of your paper)

GRADING

Your instructor will provide a grading rubric to evaluate your paper. Please see the Instructor Syllabus and Policies for details.

UNIT SIX

Activities

Week 6 Discussion Question:

What are 5-7 key lessons about Managerial Economics that you learned in this course?

Why are these lessons important to you?

End of Course Survey

Click on the End of Course Survey object to document your feedback regarding the strengths and areas for improvement for this course.

UNIT SIX ASSIGNMENTS

Final Exam:

Log into the CalUniversity Learn Center and enter this specified course. Once in the course, scroll down to the week's section. Select the available activities that may include Practice Exams, Unit Exams and Assignments.

Week 6 Project:

CalU Course Instructor will discuss the following Option with each Learner:

Option 1 – Web Research

Conduct an Internet search on the companies in "Questions for Further Study" on page 562 and answer the questions on page 563.

Submit your project in APA format with at least three in-text references. Length: 5 pages (excluding cover and reference pages)

Option 2 – Organization Comparison

Consider the organization in which you work or another organization, and answer the "questions managers must ask", on page 543. Provide a rationale for your conclusions using relevant concepts from the text.

Submit your project in APA format with at least three in-text references. Length: 5 pages (excluding cover and reference pages)

Option 3 – Create your own project.

This option provides an opportunity for you to create your own project based on the end of program capstone/dissertation. The project must include the learning objectives of the current course. This option requires the instructor's approval.

Submit your project in APA format with at least three in-text references. Length: 5 pages (excluding cover and reference pages)

Once you have finalized and completed your chosen project, submit to the Course Project assignment object.

COURSE PRESENTATION

Choose a topic that is related to one or more of the Course Objectives.

Describe the topic.

State the purpose and the importance of the course topic.

Provide an overview of the presentation.

Create 5 to 6 PowerPoint slides of the content of the topic using 3 to 5 bullets per slide.

Include speaker notes of the presentation.

Note: You could create a live presentation (such as via YouTube) and provide a link to the presentation.

Once you have finalized your course presentation, submit to the Course Presentation object.