MANAGERIAL ECONOMICS
WITH APPLICATIONS

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Preface

For many business managers of the coming generation, a course in managerial economics can be the capstone that integrates and actualizes the substance of their business education. Few of the texts now in use achieve this objective. Their theoretical sophistication places them beyond the interests and abilities of many students and their focus on mathematical derivations reduces their practicality. At the same time, the increasing computational capabilities of business managers make the concepts and procedures of managerial economics even more essential and more accessible than ever before.

This text is intended to bridge the gap between academic procedures and managerial practice. It places microeconomic theory and tools in a setting of accounting, statistics, and finance to illustrate the combined use of these techniques in real-world situations. The writing style is low-key. Calculus is used on occasion, but is thoroughly explained by a parallel stress on economic intuition. (Also, there is an appendix to Chapter 1 that covers the basic techniques and notation of the necessary calculus.) Theoretical explanations are clear, and essential mathematical procedures are developed carefully and simply. The final chapters draw together concepts and procedures from throughout the text into an integrated decision-making process.

This text stresses, perhaps more than other texts in this field:

1. An abundance of real-world boxed examples and numerical case studies,
2. In-depth coverage of core topics such as production costs and product market theory,
3. Complete chapter coverage of topics such as business uncertainty, international business, location theory, and non-profit firms,
4. Research examples throughout, providing examples of the most recent findings and their application to managerial economics, and
5. Several end-of-chapter appendices, providing either optional review material or extensive technical coverage of a topic.

The student should be aware that there is an inexpensive, accompanying IBM microcomputer simulation game in managerial economics and a problems-oriented student workbook, both authored by John Conant of Indiana State University.

This text has benefited from an extensive review process, during which the author responded to all reviewer suggestions consistent with the book's fundamental objective and emphasis. The objective is to integrate economic theory with business practice in such a way that theory is seen to be a useful guide to thinking. The emphasis is on decisions: the development of scientific patterns of thought, including the use of mathematical procedures for modelling significant business relationships and planning strategic policy.

The organization of topics is clear and well developed, with a unifying theme throughout and with easy transitions from chapter to chapter and from topic to topic within chapters. The unifying theme involves the inevitability of technical, human, and/or organizational changes, which call for new business strategy and require scientific analysis of business conditions.

Chapter 1 introduces students to the goals of the text, significant definitions, and procedures for building economic models. The appendix to Chapter 1 reviews differential and integral calculus and the use of LaGrangian multipliers. Chapters 2–4 develop the theory of consumer demand, including the determinants of demand, regression analysis to estimate demand, and econometric forecasting to project demand. Chapters 5–9 explore the core of production functions and cost curves, the use of break-even analysis and isoquants for making production decisions, consideration of long-run economies of scale and industry structure, and a demonstration of linear and geometric programming.

Chapters 10 and 11 concentrate on price policy as it relates to industry structure, including the significance of demand elasticity, firm interdependence, multi-product firms, and advertising. Chapters 12–14 develop topics related to long-term capital investment, including the time value of money and internal rate of return, the cost of capital, and risk and uncertainty in planning investments.

Chapters 15–18 include material new to many courses in managerial economics: the relevance of government regulation for managerial decisions, production decisions in not-for-profit firms, the economic theory of location, and managerial decisions in international business. Each of these final chapters reviews concepts and procedures explained in previous chapters and serves as final evidence of the useful integration of theory and practice.

Text chapters include examples, case studies, and exercises illustrating concrete and significant managerial problems. Some examples of these applications are: "Competition Comes to the Airlines," "Kaiser Aluminum Deals with Risk and Uncertainty," "The Rise of the Sunbelt," "Breaking Even in Farming," "Measuring Elasticity of Demand for Electricity," "Extracting Chemicals from Vegetable Oil," "Linear Programming for Managing a Bank's Portfolio," "Market Strategy in Inflation," "Scale Economies and Concentration in U.S. Industries," "Choosing Between Investments with Different Economic Lives," "Corporate Contributions," "Changing Costs with Changes in Plant Utilization," and "Choosing Technology for a Foreign Enterprise."

The positioning of examples and case studies within each chapter is in keeping with the author's belief that students of complex material need to pause occasionally to reflect on, to apply, and to evaluate material they have read. Nevertheless, these sections are set off so that they can be omitted. Both examples and case studies include thought-provoking questions and exercises, which appear also at the end of each chapter. Suggested answers to selected questions are provided at the end of the text.

The ideas presented in the numerous pedagogical aids help ensure that the reader does not lose track of the book's base in economic theory. The accompanying instructor's manual includes a variety of problem sets, providing ample opportunity for practice in the use of mathematical procedures explained in the text.

This textbook is relatively comprehensive and, therefore, lengthy. The decision to include significant amounts of new material was made with the expectation that instructors may be selective in their coverage. For a basic course, the appropriate chapters to cover would be Chapters 1–14, with the possible omission of Chapter 9 (Linear and Geometric Programming) and the possible addition of Chapter 15 (Government and Business). For students with extensive background in finance and statistics, the appropriate chapters would be Chapters 1–11 and Chapters 15–18.

In summary, the text represents a judicious blend of current mainstream thinking with a dash of the new. The base in economic theory is obvious throughout, but the clear intention is to apply the theory in the making of routine and periodical managerial decisions. The approach is contemporary, informative, and interesting and will motivate students to explore the ideas presented further in the business press.

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CHAPTER 1

An Introduction to Managerial Economics

Defining the role of a manager is both difficult and quite easy—*difficult* in the sense that a manager's responsibilities range over many varied and complex activities and *easy* in that the important activities can be summed up in one simple phrase. Simply stated, the role of a manager is to make decisions.

Far more than giving orders, evaluating performance, and distributing rewards, the manager's job is to answer important questions. What is to be produced, in what quantities, styles, and models, and for what markets? How should production be carried out, with what resources and technologies, and under what cost conditions? How can the company meet future challenges most effectively, allocating its human and material resources to satisfy immediate and long-range goals?

The manager's role is significant for one important reason: *change*. If circumstances remained the same year after year, managerial decisions might be made once and then implemented again and again without re-examination. In an unchanging business environment, organizations could run themselves, and managers would not be needed. By the same token, unless managers anticipate and plan for change, they are of little value to an organization. Change requires management and, in fact, justifies its existence.

The sources of business change may be classified in three ways: **technical**, **human** or **organizational**, and **financial** or **economic**.

Technical change. Changes in the techniques of production are the most obvious sources of change. A technological breakthrough in a particular industry brings changes in industrial processes. For example, the development of industrial robots brought significant changes to the U.S. automobile industry. Substituting robots for high-cost labor helped U.S. auto manufacturers cut production costs and compete more effectively with low-cost auto makers abroad. Changes in the availability and costs of raw materials force changes in methods of production. For example, the recent scarcity of petroleum forced changes in the way many firms use energy. Many manufacturing firms in the United States responded to the high price of purchased energy by arranging to "co-generate" their own power.

Human or **organizational change**. Even more complex than technical changes are changes in the human or organizational environment for production and exchange. Changing consumer markets force changes in the kinds of goods produced for sale. Moreover, as the quality and composition of the workforce change, methods of production must change. Today's better educated workers respond to different sorts of incentives than did workers of the past. They are more concerned about the quality of work life and more eager to participate in business decisions. Many firms have found that using human resources most effectively requires new concepts in business organization, such as quality circles, participatory management, and profit sharing.

Financial or **economic change**. Finally, an important source of change is the financial or economic characteristics of the markets in which firms operate. The availability of financial capital critically affects a firm's ability to function, as construction firms learned to their dismay in 1980. The high cost of funds for home mortgages that year forced many small home builders out of business. Other manufacturing firms found themselves with unsold inventory, financed at ever-rising short-term interest rates. In addition, consumer markets are notoriously fickle, yielding welcome profits (as was true for Levi Strauss and Company in 1980) or embarrassing losses (as was true for Del Taco, a regional corporation, in the same year).

To deal effectively with change emanating from only one of the sources described above requires extensive management training and experience. Few managers are fortunate enough, however, to encounter only one area of change at a time! In general, managers are constantly bombarded with new circumstances requiring careful thought and decisive action. (Some managers see new circumstances as "problems"; others view them as "opportunities.")

Making decisions is especially difficult because there is generally no *absolutely* right or wrong answer. Most decisions involve trade-offs among alternative goals. In this respect, the final answer might be described as "optimum": the best course of action given all the contradictory circumstances facing the decision maker. Suppose, for example, a necessary raw material used in a firm's operation rises in price. Production costs increase and profits fall. Managers must decide on an appropriate strategy for dealing with the change. What would you do?

1. *Would you raise the price the firm charges for its product?* Raising your product's price might cause such a drop in sales that revenue from sales falls. Also, producing a smaller volume could mean that the firm's plant and equip-