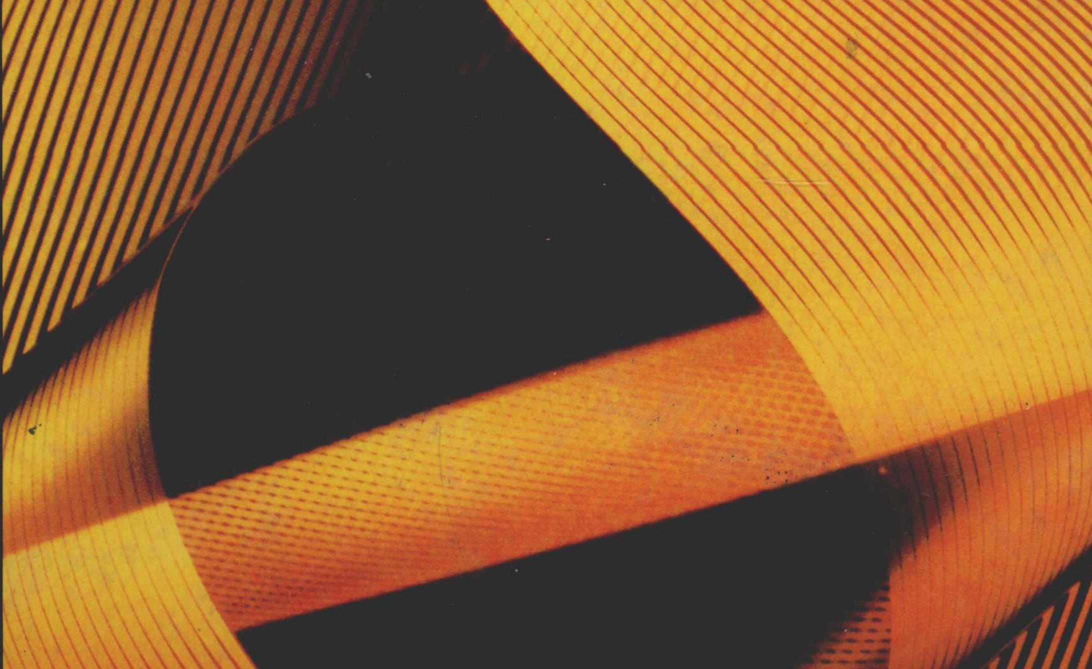
MANAGERIAL ECONOMICS

THEORY & APPLICATIONS FOR DECISION MAKING



LARRY C. PEPPERS • DALE G. BAILS

MANAGERIAL ECONOMICS

Theory and Applications for Decision Making

Larry C. Peppers, Ph.D.
Washington and Lee University
Lexington, Virginia

Dale G. Bails, Ph.D.
Memphis State University
Memphis, Tennessee

Prentice-Hall, Inc., Englewood Cliffs, New Jersey 07632

Library of Congress Cataloging-in-Publication Data

Peppers, Larry C.
Managerial economics.

Includes bibliographies and index.
1. Managerial economics. I. Bails, Dale.
II. Title.
HD30.22.P43 1987 338.5'024658 86-25278
ISBN 0-13-550055-9

To Fran, Todd, and Susan; Marcia, Juloy, and Dalene

Editorial/production supervision and interior design: Kim Gueterman
Cover design: Ben Santora
Cover photo: Paul Silverman
Manufacturing buyer: Ed O'Dougherty

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

ISBN 0-13-550055-9 01

Prentice-Hall International (UK) Limited, *London*
Prentice-Hall of Australia Pty. Limited, *Sydney*
Prentice-Hall of Canada Inc., *Toronto*
Prentice-Hall Hispanoamericana, S.A., *Mexico*
Prentice-Hall of India Private Limited, *New Delhi*
Prentice-Hall of Japan, Inc., *Tokyo*
Prentice-Hall of Southeast Asia Pte. Ltd., *Singapore*
Editora Prentice-Hall do Brasil, Ltda., *Rio de Janeiro*

Preface

Managerial economics is, most importantly, a way of thinking about and analyzing problems that occur in both the for-profit and the not-for-profit sectors of the economy. Although managerial economics encompasses a broad range of specialized topics, the common core is the application of economic theory to problems faced by organizations in a quasi-capitalistic environment. Topics in a master's-degree-level course in managerial economics are reasonably well defined when one considers just the theoretical content. Clearly, microeconomic theory must be rigorously presented before students can go on to the task of application. If the "managerial" label is to be legitimized, however, a textbook must also illustrate the "economic roots" of business departments, such as marketing, finance, accounting, and law. Practically speaking, most students will come to appreciate the linkages between microeconomic theory and various business activities only if the textbook sets forth the steps involved in applying this theory to such areas as marketing, productivity analysis, and cost measurement. While this textbook builds on a solid base of economic theory, its major source of product differentiation arises from its expanded coverage of applied microeconomic business techniques and its explicit coverage of the linkages between theory and actual business practices.

Chapter 1 quickly immerses the student in a general analysis of social and private goals and the reasons that business firms exist in a free market system. Having surveyed the ever-present tension between social goals and corporate goals, the student is then directed to a series of brief illustrations of how economics can be applied in marketing, production, personnel, finance, and law. For example, labor productivity is both a theoretical and an applied concept. Clearly, students must understand key theoretical concepts, such as the production function and marginal productivity, but they must also grasp the ways in which one can move from a theoretical production function to actual measures of labor productivity and labor cost per unit of output. The initial thrust of Chapter 1 is designed, therefore, to open students' minds to the linkages between economic theory and applied business analysis. A mini-case on telephone deregulation is presented as a way of quickly illustrating how concepts such as opportunity cost lie at the heart of many key business and government decisions. Finally, Chapter 1 presents a simple four-step decision-making framework that is meant to highlight the role of managerial economics in the task of decision making.

Chapter 2 is intended to help students understand how economic value or wealth is created by businesses in a free market system. In a way, Chapter 2 may be viewed as a mini-course in managerial economics in that it begins with the basic net present value (NPV) model of the firm's net income stream and then proceeds to illustrate how the activities of many different departments in the firm can be tied to their impact on the firm's NPV. Starting with the simplest formulation of the NPV model, the discussion sequentially expands the model to demonstrate how managerial assumptions about economic variables, such as product demand, labor cost per unit, and productivity, affect the firm's ability to create value or economic wealth. This focus on value or wealth creation is intended to help integrate the students' view of business operations. The concept of value creation is carried as a common thread throughout the book.

Chapter 3 provides a much needed "toolbox" of optimization techniques that can be used to apply the concepts of managerial economics. Because of the diversity in student backgrounds in the typical master's-level business course, it is probably worthwhile for the instructor to conduct a quick audit of the class's "level of mathematical literacy" in order to ascertain which topics in Chapter 3 would be most useful.

Chapters 4 through 7 should be viewed as an integrated unit on demand, and these chapters cover demand theory, elasticity measurement, regression analysis, and applied demand analysis in the marketing and sales departments, respectively. Chapter 4 begins with an orthodox presentation on demand theory, and the discussion is extended to include a thorough analysis of how economic variables (such as price, location, income, and population) are formulated and defined in demand analysis. Students need to understand the fundamental distinction between absolute prices and relative prices if they are going to attempt to estimate empirical demand functions. Again, variable definitions and development techniques (for example, how to construct a relative price ratio) must be explicitly set forth because students are often left dangling when it comes to the task of moving from demand theory to demand estimation. Chapter 5 is devoted to what the authors believe is one of the most used demand concepts—elasticity of demand. Starting with the basic theoretical definition of elasticity, the chapter covers a wide range of useful measures, such as price elasticity, income elasticity, cross-elasticity, and advertising elasticity. Augmenting these concepts are extensive illustrations of how such elasticity measures can be applied. Chapter 6 (which serves as a bridge between demand theory and econometric demand models) sets forth the fundamentals of simple and multiple regression analysis, as well as all of the associated tests of statistical significance. Chapter 7 integrates the demand-related material in the three previous chapters by introducing students to a series of regression models that illustrate how demand theory is actually applied in the marketing and sales departments.

Chapters 8 through 10 represent an integrated block of material covering production theory, cost theory, and empirical cost and production functions, respectively. Chapter 8 presents the traditional material on short-run and long-run production functions. Chapter 9 goes beyond the traditional coverage of short-run and long-run cost functions in order to incorporate material on accounting costs versus economic costs. In addition to material on breakeven analysis, an applied example on empirical cost measurement in the railroad industry illustrates how powerful the linearity assumption becomes when building cost models. The material in Chapter 10 blends together production and cost models through a series of actual studies that were done on industry cost functions.

Chapter 11, on risk and uncertainty, covers a wide variety of specific techniques, ranging from logarithmic utility models to certainty equivalents for the NPV model. In addition to standard material, the chapter incorporates a discussion on corporate risk policy and the psychology of risk. One clear drawback of traditional approaches to dealing with risk and uncertainty in the business environment is that business analysts tend to assume that the public will behave in a rational way to the presence of risk. In fact, research on the psychology of risk suggests that cultural factors play a major role in explaining, for example, why many individuals may be obsessed with very low-risk exposure to toxic chemicals in the environment while they ignore the much higher risk of death from smoking.

Chapter 12, on the economics of time, begins by presenting time-related concepts in the context of consumers who are considering whether to save money in the form of an individual retirement account. Having covered these time-based concepts as they apply to consumers, the analysis is then expanded to encompass corporate decisions linked to the capital budgeting process. Discounted cash flow (DCF) techniques are covered as one of several ways of evaluating the time stream of corporate cash flows. A broad discusion of DCF techniques is placed at the end of the chapter in order to highlight how strategic decisions underlie the capital budget.

Chapters 13 through 16 provide an integrated set of topics that cover the theory of the firm, applications of market structure theory, profitability analysis, and the formulation of pricing policies, respectively. As with the earlier chapters, the approach is first to present the traditional microeconomic theory of the firm and then to build on this theoretical base by linking it to actual business practices. For example, a general dichotomy is drawn in Chapter 13 between price searchers and price takers, with the former category encompassing all of the traditional behavioral models of the firm from monopolistic competition to pure monopoly. This dichotomy is related to the broad topic of barriers of entry and the role of government as a generator of market barriers. Chapter 14 expands the topic of firm behavior with a detailed examination of price leadership models, as well as by a series of examples of market analyses for selected industries. Again, the focus is on how these industries behave vis-a-vis the actual theoretical market models. Chapter 14 ends with a lengthy example dealing with global competition in the automobile industry and the structural implications of foreign competition. Chapters 15 and 16 represent the culmination of the earlier theoretical effort to explain profits and prices. In particular, the discussion in Chapter 15 includes a wide-ranging analysis of economic versus accounting profits, as well as a more advanced introduction to breakeven analysis. Chapter 16, in turn, presents a broad overview of competitive pricing techniques, as well as number of specific illustrations of pricing techniques in industries such as book publishing where the perceived value of the author is a major determinant of a book's price.

Chapter 17, on wealth creation and wealth redistribution, brings students back to the fundamental issue first raised in Chapter 1 concerning the role of business in the free enterprise economy and the interface between business and government. The chapter splits government's involvement in the economy into three areas—traditional or "old-style" regulation, new-wave regulation, and deregulation. Since most students are not familiar with new wave regulation, the comparable worth doctrine is set forth as a way of illustrating how the trade-offs between individual freedom and collective social needs are presently being made in the U.S. economy. In the final section, the adaptation of business to continued social regulation is placed in the context of the actual decisions that business leaders make on a daily basis.

We are indebted to the University of Adelaide, which holds the copyright on the publications of the late Sir R. A. Fisher, for permission to reprint the tables in Appendix B from Fisher and Yates, *Statistical Tables*.

All books are the joint effort of many people. At Creighton University, we would like to thank Vickie Reid and Fran Reed for their typing; at Memphis State University, our thanks go to Karen Pickerill. Every manuscript benefits from those who are willing to make suggestions, and we are particularly indebted to Dr. Thomas Naylor of Duke University, whose insights concerning managerial economics were especially cogent.

Larry C. Peppers
Washington And Lee University
Lexington, Virginia

Dale G. Bails
Memphis State University
Memphis, Tennessee

Contents