

SECOND EDITION

MANAGERIAL ECONOMICS AND BUSINESS STRATEGY

REPEATED GAMES, NASH EQUILIBRIUM, TWO-PART
PERFECT EQUILIBRIUM, MORAL HAZARD,
PRICING, PRICE DISCRIMINATION, OLIGOPOLY,
ADVERSE SELECTION, PERFECT COMPETITION,
AUCTIONS, BEHAVIOR, TQM, MERGER,
MONOPOLY, JAPAN, RESTRUCTURING,
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PERFECT EQUILIBRIUM, TWO-PART
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MONOPOLY, JAPAN, RESTRUCTURING,
DISCOUNTS, SALES, STRIKES

Michael R. Baye

**SECOND
EDITION**



Managerial Economics and Business Strategy

Michael R. Baye
Pennsylvania State University

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To Natalie, with love.

About the Author

Michael Baye is a Professor of Economics at The Pennsylvania State University. He received his B.S. from Texas A&M University in 1980, where he won both the University Senior Honors Thesis Prize for best undergraduate thesis and the Alfred Chalk Award for outstanding senior in the economics department. He earned a Ph.D. three years later from Purdue University.

Baye has taught managerial economics, industrial organization, and microeconomics at Purdue University, the University of Kentucky, Texas A&M University, and Penn State University, and has won two outstanding teaching awards. A prolific researcher, Baye's research on game theory, industrial organization and consumer behavior has been published in leading journals such as the *American Economic Review*, *Journal of Political Economy*, *Econometrica*, and the *Review of Economic Studies*. He has also co-authored two other books.

Baye has held visiting appointments at Erasmus University Rotterdam, Tilburg University, and the New Economic School in Moscow, Russia. He has served on numerous advisory boards and is the editor of *Advances in Applied Microeconomics*.

Preface

Thank you for making the first edition of *Managerial Economics and Business Strategy* such a success. I introduced that text to the marketplace because I believed that a modern managerial economics course must blend tools from intermediate microeconomics, industrial organization, and game theory. Happily, I am not alone in that position. Users praised the first edition both for its balanced coverage of topics and for its flexibility. Feedback from other managerial economics instructors encouraged me to stay the course.

As in the first edition, this second edition includes modern topics that have not traditionally been covered in managerial economics textbooks—contracts, vertical integration, bargaining, principal-agent problems, oligopoly, multistage and repeated games, auctions, and search, to name just a few. I am gratified by the positive response to my treatment of the organization of the firm (Chapter 6), oligopoly (Chapter 9), game theory (Chapter 10), pricing strategies (Chapter 11), and the economics of information (Chapter 12). But *Managerial Economics and Business Strategy* also covers traditional topics such as present value analysis, supply and demand, elasticities, regression analysis, indifference curve analysis, production theory and costs, and the basic models of perfect competition, monopoly, and monopolistic competition, which makes it appropriate for a wide variety of managerial economics classrooms.

In preparing for this revision, my editors at Irwin and I gathered a lot of information about the managerial economics market in general (through a series of surveys and manuscript reviews) and about the first edition of my book. The results of this market research were very interesting indeed. First, there is a significant amount of change going on in managerial economics classrooms and, as a result, these instructors have genuinely heterogeneous needs when it comes to textbooks. Users of the first edition of this text

assured us that they could easily exclude material or even entire chapters without losing continuity. The second edition preserves this flexibility, so that instructors are free to choose the topics they deem most important. Clearly this depth of flexibility is key in a time of such great change.

New to the Second Edition

Based on extensive feedback from reviewers and users of the first edition, the book has been improved in several areas. While the basic layout and structure remains the same, the writing style has been smoothed out and, where needed, explanations have been sharpened. Several new topics have been included in the second edition, including transfer pricing and more detailed treatments of moral hazard, adverse selection, and price discrimination. To accommodate the needs of instructors who teach regression techniques, the coverage of regression analysis in Chapter 3 has been substantially expanded. An important addition, according to the reviewers, is the material that shows students how to perform and interpret regressions from standard spreadsheet programs like *Excel* or *Quattro Pro* that are readily accessible to students and managers.

Here is a partial list of changes in the second edition:

- Updated and expanded “Headlines”
- Expanded coverage of regression analysis
- New and revised end-of-chapter problems
- Spreadsheet-based data diskette
- Expanded coverage of elasticities
- Expanded treatment of price discrimination
- Transfer pricing
- Updated “Selected Readings”
- Extensive list of “Additional Readings”

Key Features

Headlines

As in the first edition, each chapter begins with a Headline that is based on a real-world economic problem—a problem that students should be able to address after completing the chapter. The headlines have been thoroughly revised and expanded, and reveal the types of practical issues that can be addressed after completing a chapter. Each headline is answered at the end

of the relevant chapter—when the student is better prepared to deal with the complications of real-world problems. Adopters of the first edition liked the headlines not only because they motivated students to learn the material in the chapter, but because the answers at the end of each chapter taught students how to think like an economist.

Demonstration Problems

I firmly believe that the best way to learn economics is to work problems. So, in addition to the problems contained in the Headlines to each chapter, many Demonstration Problems are sprinkled throughout the narrative. Detailed answers to the problems are given in the main text. Users of the first edition found this feature not only provides students with a low-cost way of verifying that they have mastered the material, but they also reduce the cost to students and instructors of having to meet during office hours to discuss answers to problems.

Inside Business Applications

The second edition contains updated boxed material (called Inside Business applications) that illustrate real-world applications of the theory developed in the text. As in the first edition, I have tried to strike a balance between applications drawn from the current economic literature and the popular press.

Calculus and Non-Calculus Alternatives

Users of the first edition remarked how easy it was to include or exclude the calculus-based material without losing content or continuity. That's because the basic principles and formulae needed to solve a particular class of economic problems (e.g., $MR = MC$) are first stated without appealing to the notation of calculus. Immediately following each principle or formula is a clearly marked Calculus Alternative. Each of these calculus alternatives states the preceding principle or formula in calculus notation, and explains the relation between the calculus- and non-calculus-based formula. Thus, the book is designed for use by professors who want to integrate calculus into managerial economics, and by those who do not require students to use calculus.

Key Terms and Concepts

Each chapter ends with a list of key terms and concepts. These provide an easy way for professors to glean material covered in each chapter and for students to check their mastery of terminology.

End-of-Chapter Problems

Reviewers and survey respondents both commented on the importance of breadth and depth in the end-of-chapter problem material in managerial economics textbooks. When I looked critically at my first edition, I realized that I had not adequately met this important need. I needed to write more of them and I needed to provide a greater variety of problems for you, the instructors, to choose from. While some of the first edition material was revised and retained, I have added more than 100 end-of-chapter problems to this edition. As in the first edition, answers to selected problems are presented in an appendix at the end of the book and a complete set of answers is available to instructors in the instructor's manual.

Suggested Readings/Additional Readings

At the end of each chapter, you will find an updated list of suggested readings. In addition, I've included an end-of-book appendix that contains an extensive list of additional readings for each chapter. These readings will be very useful for professors who wish to assign course papers, projects, or who use the mini-cases also included in the instructor's manual.

Supplements

Instructor's Manual

Richard Beil and I prepared a revised instructor's manual that provides (1) a summary of each chapter, (2) a teaching outline for each chapter, (3) a set of open-ended mini-cases compiled by Darrell Parker, (4) complete answers to all end-of-chapter questions, (5) a hard-copy of the questions contained in the computerized test bank, and (6) transparency masters for key figures in the text.

Computerized Test Bank

The exam questions provided in the instructor's manual are also available in a computerized test bank. There is a WordPerfect 5.1 computerized testbank as well as Irwin's Windows-based Computest to serve the needs of all adopters.

Data Disk

By popular demand, I have written a data diskette that contains the raw data for 100 regression problems. A copy of this spreadsheet (e.g., Excel or Quattro Pro)-based data disk accompanies each student book. Regression

output for each of these problems is contained on a separate data diskette that accompanies the instructor's manual.

Student Workbook

In addition to the numerous problems and answers contained in the textbook, a thoroughly revised study guide prepared by yours truly rounds out the assortment of ancillaries for the second edition of *Managerial Economics and Business Strategy*.

ACKNOWLEDGMENTS

I am grateful to all of the instructors and students who provided feedback to improve the quality of this book. I owe a special debt to Richard Beil at Auburn University, who helped make the first edition a success. I thank my friend and colleague, Keith Crocker, for his help in organizing Chapter 6. Numerous individuals provided feedback at various stages of production of the first and second editions, and I particularly thank Dan Black, Lynn Gillette, Karen Hallows, and Darrell Parker for using early versions in their classes at the University of Kentucky, Texas A&M University, The University of Missouri, and Winthrop University, respectively. I owe a substantial debt to Sue Bryant for her patience and excellent assistance, and to my managerial economics and intermediate microeconomics students at Texas A&M and Penn State for inspiring me to write this book.

I also thank reviewers of the first and second edition for thoughtful comments and constructive criticisms. These included Dean Baim (Pepperdine University), Barbara C. Beliveau (University of Connecticut), Dan Black (University of Kentucky), Robert L. Chapman (Florida Metropolitan University), Ian Cromb (University of Western Ontario), Audrey B. Davidson (University of Louisville), Martine Duchatelet (Barry University), Kevin C. Duncan (University of Southern Colorado), David Ely (San Diego State University), Lynn G. Gillette (Northeast Missouri State University), Andrea Mays Griffith (California State University/Long Beach), Gail Heyne Hafer (Lindenwood College), Karen Hallows (University of Missouri), Mehdi Harian (Bloomsburg University), Lowell R. Jacobsen (William Jewell College), Jaswant R. Jindia (Southern University), W. J. Lane (University of New Orleans), Dwight Porter (College of St. Thomas), Craig Schulman (University of Arkansas), Peter Schwartz (University of North Carolina at Charlotte), Edward Shinnick (University College, Cook Ireland), Dean Showalter (Southwest Texas State University), Mark Stegeman (University of North Carolina), Barbara M. Suleski (Cardinal Stritch College), Roger Tutterow (Kennesaw State College), Leonard White (University of Arkansas), Mike Williams (Bethune Cookman College/Daytona Beach Community College), and Richard Winkelman (Arizona State University).

In addition I'd like to recognize and thank the more than 300 managerial economics instructors who responded to the detailed market survey and, as a result of their thoughtful suggestions, helped shape the revision plan for this book. I wish I had space to thank you each individually. As planning for the third edition will begin all too soon, I'd welcome your feedback to this revision. Visit my webpage at <http://packrat.la.psu.edu/~mbaye/bayehom.htm> or write to me directly at my internet address: baye@psu.edu.

Finally, I thank my family at home—M'Lissa, Natalie, and Mitchell—as well as my family at Irwin—Gary Nelson and Ellen Cleary—for their patience, support, and encouragement throughout this project.

Michael R. Baye
University Park
March 1996

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