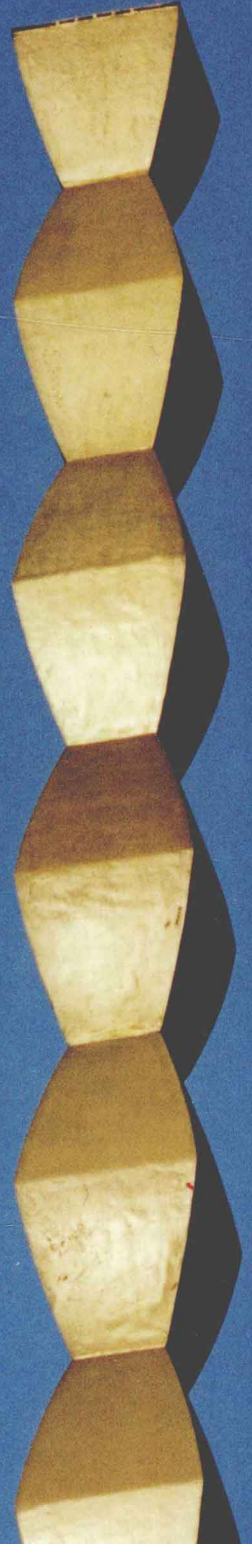


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# Managerial Economics and Business Strategy

MICHAEL R. BAYE



**FOURTH EDITION**

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# Managerial Economics and Business Strategy

**Michael R. Baye**

Bert Elwert Professor of Business Economics and Public Policy  
Kelley School of Business  
Indiana University



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*To Orlan and Rich—two teachers who changed my life.*

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## ABOUT THE AUTHOR

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Michael Baye is the Bert Elwert Professor of Business Economics and Public Policy at Indiana University's Kelley School of Business. 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. Michael earned a Ph.D. in Economics from Purdue University in 1983.

Michael has won many awards for outstanding teaching, and regularly teaches courses in managerial economics and industrial organization at the undergraduate, M.B.A., and Ph.D. level. He has also taught graduate and undergraduate courses at The Pennsylvania State University, Texas A&M University, and the University of Kentucky, where he also served on the faculty. A prolific researcher, Michael's articles on game theory, industrial organization, and pricing strategy have been published in leading economics journals, including the *American Economic Review*, *Journal of Political Economy*, *Econometrica*, and the *Review of Economic Studies*. His research has been supported by the National Science Foundation, the Fulbright Commission, and other organizations.

Michael has held visiting appointments at Cambridge, Oxford, Erasmus University, Tilburg University, and the New Economic School in Moscow, Russia. He serves on numerous editorial boards in economics as well as marketing, and is the editor of *Advances in Applied Microeconomics*.

# PREFACE TO THE FOURTH EDITION

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When I first introduced managerial economics students to game theory and business strategy back in 1989, I never dreamed that this approach would lead the market by 2002. Thanks to you all for making the first three editions of *Managerial Economics and Business Strategy* such a success.

While there have been many changes over the past decade, my goal remains the same: to provide students with the tools from intermediate microeconomics, game theory, and industrial organization that they need to make sound managerial decisions. Accordingly, this book begins by teaching managers the practical utility of basic economic tools such as present value analysis, supply and demand, regression, indifference curves, isoquants, production, costs, and the basic models of perfect competition, monopoly, and monopolistic competition. Adopters and reviewers also praise the book for its real-world examples and because it includes modern topics not contained in any other single managerial economics textbook: oligopoly, penetration pricing, multistage and repeated games, foreclosure, contracting, vertical and horizontal integration, networks, bargaining, predatory pricing, principal-agent problems, raising rivals' costs, adverse selection, auctions, screening and signaling, search, limit pricing, and a host of other pricing strategies for firms enjoying market power. This balanced coverage of traditional and modern microeconomic tools makes it appropriate for a wide variety of managerial economics classrooms. An increasing number of business schools are adopting this book to replace (or use along-side) managerial strategy texts laden with anecdotes but lacking the microeconomic tools needed to identify and implement the business strategies that are optimal in a given situation.

This fourth edition of *Managerial Economics and Business Strategy* is the most thorough revision to date. It contains all-new problems, updated data and boxed examples, and a new chapter entitled *Chapter 13: Advanced Topics in Business Strategy*. Nonetheless, my team at McGraw-Hill and I have made it very easy to transition to the fourth edition. While all material has been updated and improved where appropriate, the basic structure of the first 12 chapters is unchanged. The last chapter remains *A Manager's Guide to Government in the Marketplace*, although the number has changed to Chapter 14.

## KEY FEATURES

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The fourth edition maintains all of the key features of previous editions, but also incorporates new features that enhance students' learning experiences and make it easier to teach from this book.



## Headlines

As in previous editions, 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. These headlines are essentially handpicked “mini-cases” designed to motivate students to learn the material in the 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. Reviewers as well as users of previous editions praise the headlines not only because they motivate students to learn the material in the chapter, but because the answers at the end of each chapter help students learn how to use economics to make business decisions.

## Demonstration Problems

The best way to learn economics is to practice solving economic problems. So, in addition to the *Headlines*, each chapter contains many *Demonstration Problems* sprinkled throughout the text, along with detailed answers. This provides students with a mechanism to verify that they have mastered the material, and reduces the cost to students and instructors of having to meet during office hours to discuss answers to problems.

## Inside Business Applications

Each chapter contains boxed material (called *Inside Business* applications) to illustrate how theories explained in the text relate to a host of different business situations. As in previous editions, 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 can easily include or exclude 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 stated 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. More detailed calculus derivations are relegated to *Appendices*. Thus, the book is designed for use by instructors who want to integrate calculus into managerial economics, and by those who do not require students to use calculus.

## Key Terms and Marginal Definitions

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. In addition, marginal definitions are provided throughout the text.

## End of Chapter Problems

This fourth edition contains entirely new problems at the end of each chapter. By popular demand, two types of problems are offered. Highly structured but nonetheless challenging *Conceptual and Computational Questions* stress fundamentals. These are followed by *Problems and Applications* which are far less structured and, like real-world decision environments, may contain more information than is actually needed to solve the problem. Many of these applied problems are based on actual business events. Answers to selected problems are presented at the end of the book; detailed answers to all problems are available to instructors in the Instructor's Manual as well as on the Instructor's CD in Microsoft Word format.

## Flexibility

Instructors of managerial economics have genuinely heterogeneous textbook needs. Reviewers and users continue to praise the book for its flexibility, and assure us that sections or even entire chapters can be excluded without losing continuity.

## Learning CD

New to the fourth edition, each text includes a *Learning CD* that contains files to help students get hands-on experience at making economic decisions. The CD includes data needed for various regression problems, spreadsheet versions of key tables in the book to enable students to see how key economic concepts—like marginal cost and profit maximization—can be implemented on standard spreadsheets, and spreadsheet macros that students can use to find the optimum price and quantity under a variety of market settings, including monopoly, Cournot oligopoly, and Stackelberg oligopoly.

## SUPPLEMENTS

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I am proud to be able to say that the fourth edition of *Managerial Economics and Business Strategy* offers adopters the most comprehensive and easily accessible supplements in the market. Below I discuss popular features of some of the supplements.

### Cases

New to the fourth edition, I have designed nine full-length cases for use with *Managerial Economics and Business Strategy*. These cases contain rich detail about the market structure and conduct of firms in nine very different industries. They were prepared to complement the textbook and show how firms actually use tools like demand elasticities, markup pricing, third-degree price discrimination, bundling, Herfindahl indexes, game theory, and predatory pricing to enhance profits or shape business strategy. The cases are based on actual decisions by companies that include Microsoft, Heinz, Visa, Staples, American Airlines, Sprint, and Kodak. Instructors who adopt the fourth edition obtain the cases in the Instructor's Manual as well as in electronic format on the Instructor's CD.



## Power Point Slides

Updated Power Point Presentations are available on the Instructor's CD for adopters of the fourth edition. These presentations include slides with animated figures and graphs to make teaching and learning a snap. For instance, a simple mouse click reveals the firm's demand curve. Another click reveals the associated marginal revenue curve. Another click shows the firm's marginal cost. A few more clicks, and students see how to determine the profit-maximizing output, price, and maximum profits. Animated graphs and tables are also provided for all other relevant concepts (like Cournot and Stackelberg equilibrium, normal form and extensive form games, etc.).

## Instructor's Manual/Test Bank

A thoroughly updated instructor's manual, prepared by Michael R. Baye and Patrick Scholten, provides a summary of each chapter, a teaching outline for each chapter, and complete answers to all end-of-chapter problems. The test bank, available in Microsoft Word, is expanded in this edition to include over 1,000 multiple choice questions and over 250 problems with detailed solutions. These materials, plus additional materials such as PowerPoint Presentations and transparency masters, are all contained on the Instructor's CD.

## Transparency Masters

New to the fourth edition, transparency masters for all figures in the textbook are available in electronic format on the Instructor's CD. This gives instructors the flexibility to integrate figures from the textbook into PowerPoint Presentations or to directly print the figures on overhead transparencies.

## Study Guide

In addition to the numerous problems and answers contained in the textbook, an updated study guide prepared by yours truly is available to enhance student performance at minimal cost to students and professors.

## Website

The enhanced website for *Managerial Economics and Business Strategy* at <http://www.mhhe.com/economics/baye4> provides a host of information for students and instructors. The instructor area of the site contains downloadable versions of cases and PowerPoint presentations, as well as some of the other supplements listed above. The student site offers chapter outlines, links to useful websites, sample problems from the Study Guide, and other material designed to help students effectively use both the textbook and the Study Guide. My personal websites at <http://nash-equilibrium.com> and <http://php.indiana.edu/~mbaye/> also contain links to this and other cool sites.

## Instructor's CD

New to this edition, electronic versions of all instructor supplements (including the nine full-length cases, PowerPoint Presentations, transparency masters, over 1,000 multiple choice questions, over 250 additional problems with complete solutions, detailed solutions to every end-of-chapter problem, chapter outlines, chapter summaries, and more) may be conveniently accessed on an Instructor's CD. This makes it easy for instructors to use the many supplements I designed to make teaching managerial economics from the fourth edition easy and fun.

## NEW TO THIS EDITION

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I have made every effort to update and improve *Managerial Economics and Business Strategy* while assuring a smooth transition to the fourth edition. Below is a summary of the pedagogical improvements, enhanced supplements, and content changes that make the fourth edition an even more powerful tool for teaching and learning managerial economics and business strategy.

- An added chapter (Chapter 13) covers exciting topics in business strategy such as limit pricing, predatory pricing, raising rivals' costs, vertical foreclosure, advanced topics in commitment and timing (establishing first- and second-mover advantages), network effects, penetration pricing, and more.
- All-new problems (that's right, 100 percent!) at the end of each and every chapter. The problems are grouped so that instructors may easily assign problems stressing fundamentals, applications, or both.
- Twenty percent of the *Headlines* are brand new; the remainder have all been updated.
- Many new and updated *Inside Business* applications.
- Thoroughly updated industry statistics.
- Expanded list of *Key Terms and Concepts*.
- Expanded *Marginal Definitions*.
- Sharper diagrams and graphs.
- Learning CD included with every textbook at no additional cost.
- Test Bank now includes over 250 problems (with detailed solutions), in addition to over 1,000 multiple choice questions.
- Nine full-length cases (focusing on issues ranging from demand elasticities and pricing strategies to mergers and acquisitions) are available to instructors who adopt the fourth edition.
- Enhanced websites for students and instructors.
- *Instructor's CD* gives adopters easy access to electronic versions of all instructional supplements, including 9 full-length cases, over 1,000 multiple choice questions, over 250 additional problems with complete solutions,

detailed solutions to every end-of-chapter problem, animated PowerPoint Presentations, chapter summaries, chapter outlines, transparency masters, and more.

- Electronic transparency masters of all figures in the text give instructors the flexibility to import figures directly into PowerPoint Presentations, to print figures on overhead transparencies, or both!
- **Chapter 1** now includes a section that explains how to determine the present value of indefinitely-lived assets. It also includes a discussion of how the value of a firm changes on the ex-dividend date. Where appropriate, data and examples from the realworld have been updated.
- **Chapter 2** offers improved coverage of *consumer surplus* and *simultaneous shifts in demand and supply*. The chapter contains a new *Inside Business* application, as well as updated *Demonstration Problems* and *Inside Business* applications.
- **Chapter 3** contains a number of minor changes to improve pedagogy. For instance, natural logarithms are now denoted *ln* rather than *log* to more closely match the convention of popular spreadsheet programs. A new *Inside Business* application summarizes several recent studies indicating that the demands for many “essential” pharmaceutical products are not perfectly inelastic.
- **Chapters 4–6** offer several new *Inside Business* applications, as well as updated *Headlines* and examples. For example, Chapter 4 includes a boxed example which documents that between 10 and 30 percent of the typical in-kind gift is “lost” because it doesn’t exactly match the preferences of the recipient. Likewise, Chapter 6 includes a boxed example that is based on a recent paper by Ed Lazear in the *American Economic Review* documenting the importance and prevalence of “pay for performance” contracts.
- **Chapter 7** has thoroughly updated industry data to provide current information on concentration ratios, Herfindahl indexes, advertising levels, firm profits, R&D expenditures, and trends in mergers and acquisitions. The opening *Headline* and several *Inside Business* applications have been updated, and the discussion of mergers has been updated to include the ExxonMobil and Time Warner–AOL mergers.
- **Chapter 8** opens with a new *Headline* that uses recent marketing strategy at McDonald’s to motivate product differentiation and sustainable advantage. Several new *Inside Business* applications are included that focus on topics ranging from the competition in the computer industry to patents, trademarks, and copyrights.
- **Chapters 9–11** include a number of updated examples, *Inside Business* applications, and *Headlines* that better illustrate concepts ranging from Nash equilibrium to cross-subsidies.
- **Chapter 12** has only a few minor updates and changes, as it was extensively revised in the third edition.

- **Chapter 13** is a new chapter called *Advanced Topics in Business Strategy* that received uniformly positive reviews. It extends the basic oligopoly and game theoretic tools introduced in Chapters 9 and 10 to show how managers can sometimes lessen competition by limit pricing, predatory pricing, raising rivals' costs, or using price discrimination as a strategic tool. It also shows how managers can change the strategic environment by creating first- or second-mover advantages, or by using penetration pricing to overcome network effects. The *Inside Business* applications in this chapter are among the most lively in the book, covering topics such as business strategy at Microsoft, why being first isn't necessarily an advantage, and Yahoo!'s attempt to use penetration pricing to capture a share of eBay's online auction business.
- **Chapter 14**—*A Manager's Guide to Government in the Marketplace*—was Chapter 13 in previous editions of *Managerial Economics and Business Strategy*. It opens with a new *Headline*, and has been updated where appropriate.

## ACKNOWLEDGMENTS

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I thank the many users of *Managerial Economics and Business Strategy* who provided both direct and indirect feedback that has helped improve *your* book. This includes thousands of students at Indiana University's Kelley School of Business, hundreds of instructors worldwide who have used my book in their own classrooms, colleagues who unselfishly gave up their own time to provide me with comments and suggestions, and reviewers who provided detailed suggestions to improve this and previous editions of the book. I especially thank the following professors for enlightening me on the market's diverse needs and for providing suggestions and constructive criticisms to improve this book:

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As always, I welcome your comments and suggestions for the next edition. Visit my websites at <http://nash-equilibrium.com> and <http://php.indiana.edu/~mbaye> or write to me directly at [mbaye@indiana.edu](mailto:mbaye@indiana.edu).

**Michael R. Baye**  
**Bloomington, Indiana**  
**May, 2002**



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