EIGHTH EDITION

MICROECONOMIC THEORY

BASIC PRINCIPLES AND EXTENSIONS

WALTER NICHOLSON

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Preface

The eighth edition of *Microeconomic Theory: Basic Principles and Extensions* is intended to provide students with a comprehensive and accessible summary of modern microeconomic theory. This general goal for the text has remained constant over the past thirty years despite vast changes in the actual topics covered. Ideally this is accomplished by including clear, intuitive explanations of the principal results and by stressing the mathematical structure common to most microeconomic problems. The text also seeks to provide a link to more advanced literature by including a number of "extensions" that gather in one place results that are frequently assumed in that literature.

New to the Eighth Edition

This edition continues the general pruning and refocusing of the text that was started in the Seventh Edition together with some extensive rewriting of several chapters. Important additions include:

- A completely reworked chapter on externalities that raises the theoretical level of this material to be more consistent with other parts of the text;
- A revised chapter on public economics that now stresses some recent results in the "New Political Economy";
- Major streamlining of much of the material on the theory of the firm—especially in connection with the development of the theory of costs;
- A new extension on second-order conditions that introduces a bit of (low key) matrix algebra;
- A variety of other new extensions and problems on such topics as auctions, preference revelation, environmental regulation, and a number of topics in finance; and
- Revised student aids, including (1) Answers to "Queries" that accompany each example, (2) Brief answers to odd-numbered problems, and (3) a complete glossary.

All of the ancillaries have also been updated for this new edition. These include:

- The comprehensive student *Workbook* by David Stapleton, Cornell University;
- The *Solutions Manual and Test Bank*—available to instructors; and
- The homepage for the text located at www.harcourtcollege.com/econ/

Harcourt College Publishers will provide copies of these supplements free of charge to those instructors qualified under its adoption policy. Please contact your local sales representative to learn how you may qualify.

Acknowledgments

I am indebted to all of the economists who have taken the opportunity to offer suggestion about how this book might be improved and made more useful over all of its editions. Especially helpful for this edition were a series of detailed reviews of the Seventh Edition prepared by:

- Stephen A. Baker, Capital University
- Kwang Soo Cheong, University of Hawaii
- Linda Ghent, Eastern Illinois University
- John Hoag, Bowling Green State University
- Nicholas S. Vonortas, George Washington University

I have tried to follow all of the advice I was given—though sometimes I have been a bit stubborn. Readers who find the extension on second-order conditions especially trying, for example, have no one to blame but me since I was uniformly advised against including this.

Amherst colleagues who have provided me with much good advice over the years include Frank Westhoff, Lisa Takeyama, and John Irons. I hope they will agree that I have (finally) made significant improvements in my coverage of public goods issues. Students who have made major contributions to the book over many years include Mark Bruni, Eric Budish, Adrian Dillon, David Macoy, Jordan Milev, Tatyana Mamut, Katie Merrill, and Jeff Rodman. Teaching at Amherst remains fun because of a never-ending stream of such students telling me where I have gone wrong.

The staff at Thomson Learning did its usual thoroughly professional job in bringing this edition to publication in seemingly record time. Amy Porubsky was especially helpful in handling all phases of the book's development—how she can handle so many tasks simultaneously is more amazing to me than the Walrasian general equilibrium. The copyediting by Steve Henne caught many of my errors and really improved my writing style in several places. The larger format design of this edition was developed by Jeanne Wolfgeher—I hope this format proves to be much more suitable for this rather bulky book. Carol O'Connell supervised the production of the book at Graphic World and I am very grateful for her ability to catch many potential problems at the last minute.

Special thanks again are owed my family for helping with the preparation of this book—most of the difficulties have now landed on Susan, who now must endure (with uncommonly good spirits) my grumpiness more-or-less alone since we

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entered emptynesthood. To the list of children who have not read this book (Kate, David, Tory, and, at least for the moment, Paul), I must now add two spouses—Brad and Kyu. But I love them all despite their lack of enlightenment. The highpoint for me of 2001 was the addition of two new grandchildren (Sarah and David) who, when added to two-year-old Beth, are beginning to constitute a large new generation of potential nonreaders. I would be more than happy to read the book to them in place of Dr. Seuss, but I doubt they will be much interested.

Walter Nicholson
Amherst, Massachusetts

About the Author

Walter Nicholson is the Ward H. Patton Professor of Economics at Amherst College. He received his B.A. in mathematics from Williams College and his Ph.D. in economics from the Massachusetts Institute of Technology. Professor Nicholson's primary research interests are in the econometric analyses of labor market problems including welfare, unemployment, and the impact of international trade. He is also the author of *Intermediate Microeconomics and Its Application, Eighth Edition* (Harcourt College Publishers/The Dryden Press, 2000).

Professor Nicholson and his wife, Susan, live in Amherst, Massachusetts. Their four children (Kate, David, Tory, and Paul) are all successful adults now and are much missed underfoot. Over the past three years, the Nicholson family has grown to include three grandchildren, Elizabeth, Sarah, and David, now joyfully helping to fill up their house. The Nicholsons also share that home with their sedate and loveable Labrador Retriever, Tobler.

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PART I

INTRODUCTION

1 ECONOMIC MODELS

2 THE MATHEMATICS OF OPTIMIZATION

This part consists of two chapters that provide some background for the study of microeconomic theory. Chapter 1 describes the general approach used in microeconomics, with particular attention to showing how economists devise and verify simple models of economic activity. Some of the philosophical issues involved in the construction of economic models, together with an analysis of how "good" models might be differentiated from "bad" ones, are also discussed.

Chapter 2 has a mathematical orientation. It describes several methods that can be used to solve maximization (and minimization) problems. Because many economic models start with the assumption that economic agents (individuals, firms, government agencies, and so forth) are seeking the maximum value of something, given their limited resources, such problems provide a major focus for this book. The mathematical techniques introduced in Chapter 2 will be used repeatedly in later chapters to derive implications about economic behavior.

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