Seventh Canadian Edition

PRINCIPLES OF micro ECONOMICS

MANKIW KNEEBONE McKENZIE

PART 5: FIRM BEHAVIOUR AND THE ORGANIZATION OF INDUSTRY

Chapter 13 The Costs of Production
Chapter 14 Firms in Competitive Markets

The theory of the firm sheds light on the decisions that lie behind supply in competitive markets.

Chapter 15 Monopoly
Chapter 16 Monopolistic Competition
Chapter 17 Oligopoly

Firms with market power can cause market outcomes to be inefficient.

PART 6: THE ECONOMICS OF LABOUR MARKETS

Chapter 18 The Markets for the Factors of Production
Chapter 19 Earnings and Discrimination
Chapter 20 Income Inequality and Poverty

The special features of labour markets, in which most people earn most of their income.

PART 7: TOPICS FOR FURTHER STUDY

Chapter 21 The Theory of Consumer Choice
Chapter 22 Frontiers of Microeconomics

Additional topics in microeconomics include household decision making, asymmetric information, political economy, and behavioural economics.

Seventh Canadian Edition

PRINCIPLES OF
micro ECONOMICS

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NELSON EDUCATION

Principles of Microeconomics, Seventh Canadian Edition

by N. Gregory Mankiw, Ronald D. Kneebone, and Kenneth J. McKenzie

VP, Product and Partnership Solutions:
Anne Williams

Publisher, Digital and Print Content:
Anne-Marie Taylor

Marketing Manager:
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Technical Reviewer:
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Content Development Manager:
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Managing Designer:
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Cover Design:
Courtney Hellam

Cover Image:
Claude Robidoux/Getty Images

Compositor:
MPS Limited

Printed and bound in Canada
1 2 3 4 19 18 17 16

For more information contact Nelson Education Ltd., 1120 Birchmount Road, Toronto, Ontario, M1K 5G4. Or you can visit our Internet site at http://www.nelson.com

Library and Archives Canada Cataloguing in Publication Data

Mankiw, N. Gregory, author
Principles of microeconomics / N. Gregory Mankiw, Harvard University, Ronald D. Kneebone, University of Calgary, Kenneth J. McKenzie, University of Calgary. — Seventh Canadian edition.

Includes bibliographical references and index.
Issued in print and electronic formats.
ISBN 978-0-17-659197-7 (paperback).—
ISBN 978-0-17-676776-1 (pdf)

1. Microeconomics—Textbooks. 2. Microeconomics—Canada—Textbooks. I. Kneebone, Ronald D. (Ronald David), 1955-, author II. McKenzie, Kenneth J. (Kenneth James), 1959-, author III. Title.

HB172.M368 2016 338.5
C2016-903309-0
C2016-903310-4

ISBN-13: 978-0-17-659197-7
ISBN-10: 0-17-659197-4

To Catherine, Nicholas, and Peter, my other contributions to the next generation

To our parents and Cindy, Kathleen, and Janetta—thanks for your support and patience

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Kevin LeBlanc

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Professor Mankiw is a prolific writer and a regular participant in academic and policy debates. His work has been published in scholarly journals such as the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*, and in more popular forums such as *The New York Times, The Financial Times, The Wall Street Journal,* and *Fortune*. He is also author of the best-selling intermediate-level textbook *Macroeconomics* (Worth Publishing). In addition to his teaching, research, and writing, Professor Mankiw has been a research associate of the National Bureau of Economic Research, an adviser to the Federal Reserve Bank of Boston and the Congressional Budget Office, and a member of the Educational Testing Service (ETS) test development committee for the advanced placement exam in economics. From 2003 to 2005, he served as Chairman of the President's Council of Economic Advisers.

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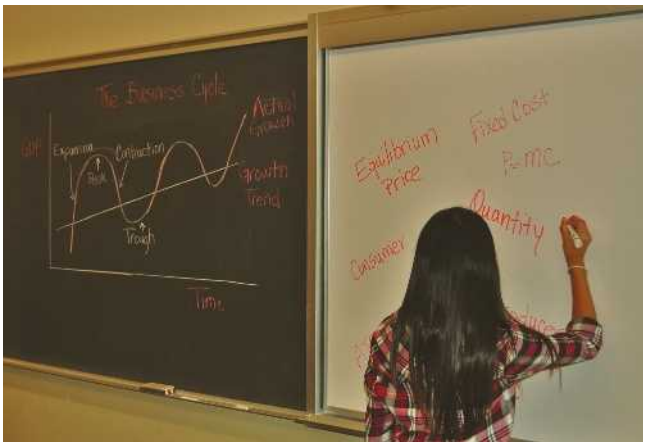

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PART 2 SUPPLY AND DEMAND I: HOW MARKETS WORK

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PREFACE

As soon as we got our hands on the first U.S. edition of *Principles of Microeconomics*, it was clear to us that "this one is different." If other first-year economics textbooks are encyclopedias, Gregory Mankiw's was, and still is, a handbook.

Between us, we have many years of experience teaching first-year economics. Like many instructors, we found it harder and harder to teach with each new edition of the thick, standard textbooks. It was simply impossible to cover all of the material. Of course, we could have skipped sections, features, or whole chapters, but then, apart from the sheer hassle of telling students which bits to read and not to read, and worries about the consistencies and completeness of the remaining material, we ran the risk of leaving students with the philosophy that what matters is only what's on the exam.

We do not believe that the writers of these other books set out with the intention of cramming so much material into them. It is a difficult task to put together the perfect textbook—one that all instructors would approve of and that all students would enjoy using. Therefore, to please all potential users, most of the books end up covering a wide range of topics. And so the books grow and grow.

Professor Mankiw made a fresh start in the first U.S. edition. He included all the important topics and presented them in order of importance. And in the seventh U.S. edition, he has resisted the temptation to add more and more material. We have, in adapting the text for Canadian students, taken a minimalist approach: "If it isn't broken, don't fix it!" While the book is easily recognizable as Mankiw's, we have made changes that increase its relevance to Canadian students. Some of these changes reflect important differences between the Canadian and U.S. economies. For example, the Canadian economy is much smaller and more open than the U.S. economy, and this fact is explicitly recognized in this edition. Other changes reflect important institutional differences between the two countries, including the structure of the tax system and the nature of competition policy. Finally, the Canadian edition focuses on issues and includes examples that are more familiar and relevant to a Canadian audience.

We would not have agreed to participate in the Canadian edition if we were not extremely impressed with the U.S. edition. Professor Mankiw has done an outstanding job of identifying the key concepts and principles that every first-year student should learn.

It was truly a pleasure to work with such a well-thought-out and well-written book. We have enjoyed teaching from the earlier Canadian editions and we look forward to using the seventh Canadian edition. We hope you do, too.

How the Book Is Organized

To write a brief and student-friendly book, Mankiw considered new ways to organize familiar material. What follows is a whirlwind tour of this text. The tour, we hope, will give you a sense of how the pieces fit together.

Introductory Material

Chapter 1, "Ten Principles of Economics," introduces students to the economist's view of the world. It previews some of the big ideas that recur throughout economics, such as opportunity costs, marginal decision making, the role of incentives, the gain from trade, and the efficiency of market allocations. Throughout the text an effort is made to relate the discussion back to the ten principles of economics introduced in Chapter 1. The interconnections of the material with the ten principles are clearly identified throughout the text.

Chapter 2, "Thinking Like an Economist," examines how economists approach their field of study, discussing the role of assumptions in developing a theory and introducing the concepts of an economic model. It also discusses the role of economists in making policy. The appendix to this chapter offers a brief refresher course on how graphs are used and how they can be abused.

Chapter 3, "Interdependence and the Gains from Trade," presents the theory of comparative advantage. This theory explains why individuals trade with their neighbours, as well as why nations trade with other nations. Much of economics is about how market forces coordinate many individual production and consumption decisions. As a starting point for this analysis, students see in this chapter why specialization, interdependence, and trade can benefit everyone.

The Fundamental Tools of Supply and Demand

The next three chapters introduce the basic tools of supply and demand. Chapter 4, "The Market Forces of Supply and Demand," develops the supply curve, the demand curve, and the notion of market equilibrium. Chapter 5, "Elasticity and Its Application," introduces the concept of elasticity and uses it to analyze events in three different markets. Chapter 6, "Supply, Demand, and Government Policies," uses these tools to examine price controls, such as rent-control and minimum-wage laws, and tax incidence.

Chapter 7, "Consumers, Producers, and the Efficiency of Markets," extends the analysis of supply and demand using the concepts of consumer surplus and producer surplus. It begins by developing the link between consumers' willingness to pay and the demand curve, and the link between producers' costs of production and the supply curve. It then shows that the market equilibrium maximizes the sum of the producer and consumer surplus. Thus, students learn early about the efficiency of market allocations.

The next two chapters apply the concepts of producer and consumer surplus to questions of policy. Chapter 8, "Application: The Costs of Taxation," shows why taxation results in deadweight losses and what determines the size of those losses. Chapter 9, "Application: International Trade," considers who wins and who loses from international trade and presents the debate over protectionist trade policies.

More Microeconomics

Having examined why market allocations are often desirable, the book then considers how the government can sometimes improve on them. Chapter 10, "Externalities," explains how external effects such as pollution can render market outcomes inefficient and discusses the possible public and private solutions to those inefficiencies. Chapter 11, "Public Goods and Common Resources," considers the problems that arise when goods, such as national defence, have no market price. Chapter 12, "The Design of the Tax System," describes how the government raises the revenue necessary to pay for public goods. It presents some institutional

background about the Canadian tax system and then discusses how the goals of efficiency and equity come into play when designing a tax system.

The next five chapters examine firm behaviour and industrial organization. Chapter 13, "The Costs of Production," discusses what to include in a firm's costs and introduces cost curves. Chapter 14, "Firms in Competitive Markets," analyzes the behaviour of price-taking firms and derives the market supply curve. Chapter 15, "Monopoly," discusses the behaviour of a firm that is the sole seller in its market, the inefficiency of monopoly pricing, the possible policy responses, and the attempts by monopolies to price-discriminate. Chapter 16, "Monopolistic Competition," looks at behaviour in a market in which many sellers offer similar but differentiated products. It also discusses the debate over the effects of advertising. Chapter 17, "Oligopoly," covers markets in which there are only a few sellers, using the prisoners' dilemma as the model for examining strategic interaction.

The next three chapters present issues related to labour markets. Chapter 18, "The Markets for the Factors of Production," emphasizes the link between factor prices and marginal productivity. Chapter 19, "Earnings and Discrimination," discusses the determinants of equilibrium wages, including compensating differentials, human capital, and discrimination. Chapter 20, "Income Inequality and Poverty," examines the degree of inequality in Canadian society, alternative views about the government's role in changing the distribution of income, and various policies aimed at helping society's poorest members.

The final two chapters present optional material. Chapter 21, "The Theory of Consumer Choice," analyzes individual decision making using budget constraints and indifference curves. Chapter 22, "Frontiers of Microeconomics," introduces the topics of asymmetric information, political economy, and behavioural economics. Some instructors may skip all or some of this material. Instructors who do cover these topics may choose to assign these chapters earlier than they are presented in this text, and they have been written to give that flexibility.

walk-through

The purpose of this textbook is to help students learn the fundamental lessons of economics and to show how such lessons can be applied to the world in which they live. Toward that end, various learning tools recur throughout the book.

Chapter Openers Well-designed chapter openers act as previews that summarize the major concepts to be learned in each chapter.

Case Studies Economic theory is useful and interesting only if it can be applied to understanding actual events and policies. Updated or replaced with more current Canadian examples, the numerous case studies apply the theory that has just been developed.

Figures and Tables Colourful and eye-catching visuals are used to make important economic points and to clarify Canadian and other key economic concepts. They have also proved to be valuable and memorable teaching aids.

FIGURE 14.9
An Upward Sloping Long-Run Supply Curve

The market starts in long-run equilibrium at point A in both panels. In panel (a) at point A, each firm is maximizing profits by choosing a quantity where price equals marginal cost, and we are in a long-run equilibrium, with the price P_1 equal to average total cost and economic profits are zero. In panel (b) at point A, market demand equals short-run market supply. Panel (b) shows what happens in the short run as demand increases from D_1 to D_2. The short-run equilibrium goes from point A to point B, and the price rises from P_1 to P_2. Because the price exceeds average total costs, firms make profits, which over time attract entrants into the market. This entry shifts the short-run supply curve to the right. It also bids up the price of an input to the production of the good, say land, which shifts up the average total cost curve. In the new long-run equilibrium the price is P_3, which is equal to the minimum of the new long-run average-cost curve, ATC_2. Profits are again zero and there are more firms to satisfy the greater demand, but the new equilibrium price P_3 is higher than the original price P_1 because of the increase in average total costs associated with entry. This generates an upward sloping long-run supply curve, as shown in panel (b).

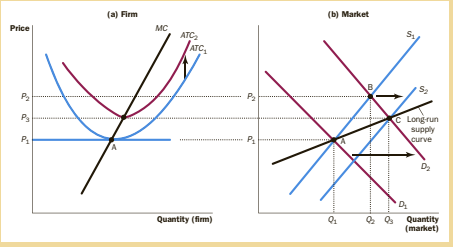

TABLE 14.2
Profit Maximization: A Numerical Example

Quantity (Q)	Total Revenue (TR)	Total Cost (TC)	Profit (TR − TC)	Marginal Revenue (MR = ΔTR/ΔQ)	Marginal Cost (MC = ΔTC/ΔQ)	Change in Profit (MR − MC)
0 jugs	$0	$3	−$3	$6	$2	$4
1	6	5	1	6	3	3
2	12	8	4	6	4	2
3	18	12	6	6	5	1
4	24	17	7	6	6	0
5	30	23	7	6	7	−1
6	36	30	6	6	8	−2
7	42	38	4	6	9	−3
8	48	47	1			

"In the News" Features One benefit that students gain from studying economics is a new perspective and greater understanding about news from Canada and around the world. To highlight this benefit, excerpts from many Canadian news articles, including opinion columns written by prominent economists, show how basic economic theory can be applied.

IN THE news

Even Criminals Respond to Incentives

Principle #4, people respond to incentives, is at the core of the study of economics. As the following article explains, this principle applies to all sorts of activities, even of the criminal kind.

Risk, Reward and the Economics of the Criminal Mind

By Todd Hirsch

Last week's *Economist* magazine carried a headline reading, "The Curious Case of the Fall in Crime." It seems that all around the industrialized world—including Canada—all kinds of criminal activity are on the decline. Contrary to the belief that evil thugs lurk around every corner, we are actually safer than we have been in decades. In today's underground economy, identity theft makes better economic sense than stealing a flat-screen television.

The magazine's editorial offers only guesses as to why crime rates are falling. Aging demographics may play a role, along with better theft-prevention technologies. Stiffer punishment and "get tough on crime" policies might make for good political posturing, but they seem to have little impact: Crime rates are falling in countries where sentencing has become tougher as well as where it has been loosened.

The Economist failed to mention the most obvious reason for the change: economic incentives. Thieves are simply doing what most of us do every day: They are responding to market signals.

This is particularly true of property crimes such as residential break-and-enter, car theft and armed robbery. The possible payoff for stealing from a home is dwindling. What is there worth taking? Electronics are increasingly less valuable—a computer or a television in the 1980s would have been worth thousands of dollars on the street; now they would fetch a few hundred bucks. Why buy a stolen iPod dock out of the back of some guy's truck when you can get a new one for less than $100?

Car theft is down dramatically, too. According to Statistics Canada, car theft in Ontario plunged to 141 per 100,000 people last year, down from 443 in 1998. Better technology, car alarm systems and anti-theft devices have deterred most would-be thieves. And lower-priced cars without car alarms probably are not worth stealing anyway. The bad guys aren't less bad, they're just good economists.

Muggings and purse snatchings are increasingly less common as well. But let's not overthink the reasons why fewer thieves are snatching purses. It has nothing to do with the culprit's age or job situation. Whether there was a father present in the thief's childhood or whether he or she played violent video games are irrelevant. The reason is that there's just not much of value inside purses or wallets anymore. Cash has been largely replaced by debit and credit cards, and as long as the PIN is secure, the thief gets away with nothing more than plastic cards and chewing gum. Cellphones are more costly, but stolen ones are difficult to wipe and resell.

Criminals, like all of us, respond to market signals. If the potential payoff for any activity is too low, we weigh the risks and decide it isn't worth it. For noncriminals, the question isn't "Should I steal this car?" but something along the lines of "Should I put in new bathroom tile before I list my house?" People are quite good at reading and responding to market signals.

Still, we shouldn't think that poor economic incentives are making crime go away. Crime is simply morphing. Traditional crime statistics tend to focus on activities such as robbery, property theft and murder. Fewer long-term trend statistics are available for crimes that are doubtless increasing, such as identity theft and cybercrime. Not only are they potentially more lucrative, they are global in scope and much more difficult to track.

Thieves are also getting smarter, using technology for evil deeds. Internet scams abound, and bank-card skimming and credit-card fraud is a serious problem. Banks have had to fight back with their own technology and it has been costly.

Economic incentives play a huge role motivating us in almost everything we do. Certain actions are no doubt spurred by altruism and generosity, such as helping our neighbour shovel snow or donating to charity (although we still want the tax receipt). Weighing the financial incentives against the potential risks is the basis of our economy. Criminals may not know they're doing it, but they're just responding to market signals—and doing a good job of it.

Source: "Risk, Reward and the Economics of the Criminal Mind," by Todd Hirsch, August 1, 2013, *The Globe and Mail*, Reproduced by permission of the author.

FYI

Monopsony

On the preceding pages, we built our analysis of the labour market with the tools of supply and demand. In doing so, we assumed that the labour market was competitive. That is, we assumed that there were many buyers of labour and many sellers of labour, so each buyer or seller had a negligible effect on the wage.

Yet imagine the labour market in a small town dominated by a single large employer. That employer can exert a large influence on the going wage, and it may well use that market power to alter the outcome. Such a market in which there is a single buyer is called a *monopsony*.

A monopsony (a market with one buyer) is in many ways similar to a monopoly (a market with one seller). Recall from Chapter 15 that a monopoly firm produces less of the good than would a competitive firm; by reducing the quantity offered for sale, the monopoly firm moves along the product's demand curve, raising the price and also its profits. Similarly, a monopsony firm in a labour market hires fewer workers than would a competitive firm; by reducing the number of jobs available, the monopsony firm moves along the labour supply curve, reducing the wage it pays and raising its profits. Thus, both monopolists and monopsonists reduce economic activity in a market below the socially optimal level. In both cases, the existence of market power distorts the outcome and causes deadweight losses.

This book does not present the formal model of monopsony because, in the real world, monopsonies are rare. In most labour markets, workers have many possible employers, and firms compete with one another to attract workers. In this case, the model of supply and demand is the best one to use.

"FYI" Features These features provide additional material "for your information." Some of them offer a glimpse into the history of economic thought. Others clarify technical issues. Still others discuss supplementary topics that instructors might choose either to discuss or skip in their lectures.

1. Is the good **excludable**? Can people be prevented from using the good?
2. Is the good **rival in consumption**? Does one person's use of the good diminish another person's ability to use it?

Using these two characteristics, Figure 11.1 divides goods into four categories:

1. **Private goods** are both excludable and rival in consumption. Consider an ice-cream cone, for example. An ice-cream cone is excludable because it is possible to prevent someone from eating one—you just don't give it to her. An ice-cream cone is rival in consumption because if one person eats an ice-cream cone, another person cannot eat the same cone. Most goods in the economy are private goods like ice-cream cones: You don't get one unless you pay for it, and once you have it, you are the only person who benefits.

excludability
the property of a good whereby a person can be prevented from using it

rival in consumption
the property of a good whereby one person's use diminishes other people's use

private goods
goods that are both excludable and rival

Key Concept Definitions When key concepts are introduced in the chapter, they are presented in **bold** typeface. In addition, their definitions are placed in the margin and in the "Glossary" at the back of the book. This treatment helps students learn and review the material.

QUICK **Quiz** *Why is a country better off not isolating itself from all other countries? • Why do we have markets and, according to economists, what roles should government play in them?*

QuickQuizzes After each major section, students are offered a quick quiz to check their comprehension of what they have just learned. If students cannot readily answer these quizzes, they should stop and reread the material before continuing.

Chapter Summaries Each chapter ends with a brief summary that reminds students of the most important lessons that they have just learned. Later in their study, it offers an efficient way to review for exams.

summary

- The fundamental lessons about individual decision making are that people face tradeoffs among alternative goals, that the cost of any action is measured in terms of forgone opportunities, that rational people make decisions by comparing marginal costs and marginal benefits, and that people change their behaviour in response to the incentives they face.
- The fundamental lessons about interactions among people are that trade can be mutually beneficial, that markets are usually a good way of coordinating trade among people, and that the government can potentially improve market outcomes if there is some market failure or if the market outcome is inequitable.
- The fundamental lessons about the economy as a whole are that productivity is the ultimate source of living standards, that money growth is the ultimate source of inflation, and that society faces a short-run tradeoff between inflation and unemployment.

KEY concepts

scarcity, *p. 2*
economics, *p. 2*
efficiency, *p. 3*
equity, *p. 3*
opportunity cost, *p. 4*
rational people, *p. 4*
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market failure, *p. 11*
externality, *p. 11*
market power, *p. 11*
productivity, *p. 12*
inflation, *p. 13*
business cycle, *p. 14*

QUESTIONS FOR review

1. Why are coal miners paid more than other workers with similar amounts of education?
2. In what sense is education a type of capital?
3. How might education raise a worker's wage without raising the worker's productivity?
4. What conditions lead to economic superstars? Would you expect to see superstars in dentistry? In economics? Explain.
5. Give three reasons why a worker's wage might be above the level that balances supply and demand.
6. What difficulties arise in deciding whether a group of workers has a lower wage because of discrimination?
7. Do the forces of economic competition tend to exacerbate or ameliorate discrimination on the basis of race?
8. Give an example of how discrimination might persist in a competitive market.

QUICK CHECK multiple choice

1. Ricky leaves his job as a high school math teacher and returns to school to study the latest developments in computer programming, after which he takes a higher-paying job at a software firm. This is an example of which of the following?
   a. a compensating differential
   b. human capital
   c. signalling
   d. efficiency wages
2. Lucy and Ethel work at a local department store. Lucy, who greets customers as they arrive, is paid less than Ethel, who cleans the bathrooms. This is an example of which of the following?
   a. a compensating differential
   b. human capital
   c. signalling
   d. efficiency wages
3. Fred runs a small manufacturing company. He pays his employees about twice what other firms in the area pay, even though he could pay less and still recruit all the workers he wants. He believes that higher wages make his workers more loyal and hard-working. This is an example of which of the following?
   a. a compensating differential
   b. human capital
   c. signalling
   d. efficiency wages
4. A business consulting firm hires Vivian because she was a math major in college. Her new job does not require any of the mathematics she learned, but the firm believes that anyone who can graduate with a math degree must be very smart. This is an example of which of the following?
   a. compensating differential
   b. human capital
   c. signalling
   d. efficiency wages
5. Why is it difficult to measure how much discrimination affects labour market outcomes?
   a. data on wages are crucial but not readily available
   b. firms misreport the wages they pay to hide discriminatory practices
   c. workers differ in their attributes and the types of jobs they have
   d. the same minimum-wage law applies to workers in all groups
6. The forces of competition in markets with free entry and exit tend to eliminate wage differentials that arise from discrimination by which of the following groups?
   a. employers
   b. customers
   c. government
   d. employees

PROBLEMS AND applications

1. University and college students sometimes work as summer interns for private firms or the government. Many of these positions pay little or nothing.
   a. What is the opportunity cost of taking such a job?
   b. Explain why students are willing to take these jobs.
   c. If you were to compare the earnings later in life of workers who had worked as interns and those who had taken summer jobs that paid more, what would you expect to find?
2. As explained in Chapter 6, a minimum-wage law distorts the market for low-wage labour. To reduce this distortion, some economists advocate a two-tiered minimum-wage system, with a regular minimum wage for adult workers and a lower, "sub-minimum"

List of Key Concepts A list of key concepts at the end of each chapter offers students a way to test their understanding of the new terms that have been introduced. Page references are included so that students can review terms they do not understand in the original context.

Questions for Review At the end of each chapter are questions for review that cover the chapter's primary lessons. Students can use these questions to check their comprehension and to prepare for exams.

Quick Check Multiple Choice New in this edition, these end of chapter questions provide a quick check of the student's understanding of the material in a multiple-choice format.

Problems and Applications Each chapter also contains a variety of problems and applications that ask students to apply the material they have learned. Some instructors may use these questions for homework assignments. Others may use them as a starting point for classroom discussion.

New in This Seventh Canadian Edition

The seventh Canadian edition of *Principles of Microeconomics* has been carefully revised to ensure its contents are current and its examples reflect the interests and concerns of the student market. In the sixth edition, responding to reviewers who requested additional but unobtrusive mathematics support, we have supplemented four chapters with new appendices: "The Mathematics of Market Equilibrium" (Chapter 4), "The Mathematics of Market Equilibrium with Taxes" (Chapter 6), "The Mathematics of Consumer and Producer Surplus" (Chapter 7), and "The Mathematics of Deadweight Loss" (Chapter 8). We have "tweaked" this in the seventh edition, relying more on a numerical approach, carrying the same demand and supply curves throughout the appendices. We have also included technical questions in all end-of-appendix assignments and assured their difficulty level. Examples, key figures, and graphs have been updated throughout the text. Most photos have been replaced and many new photos are added throughout the new edition. As well, the text's interior has a fresh new design.

Here is a chapter-by-chapter list of significant changes:

Chapter 1 A new FYI feature on the opportunity cost of gasoline has been provided.

Chapter 2 A new Graphing Functions sections has been included in the appendix.

Chapter 4 The appendix "The Mathematics of Market Equilibrium," which guides the student through the process of solving for market equilibrium for linear demand and supply curves, has been simplified using a strictly numerical approach.

Chapter 5 A new Case Study on Amazon and the pricing of e-books has been added.

Chapter 6 The appendix "The Mathematics of Market Equilibrium with Taxes" carries over the same numerical example introduced in the Chapter 4 appendix on the mathematics of market equilibrium. This appendix shows the student how to include taxes in solving for market equilibrium.

Chapter 7 A new appendix on "The Mathematics of Consumer and Producer Surplus" has been added, carrying forward the same numerical example from previous chapters.

Chapter 8 The appendix "The Mathematics of Deadweight Loss" carries forward the numerical example from previous chapters to show the student how to calculate the deadweight loss of a tax.

Chapter 9 The discussion on the deadweight loss of tariffs has been expanded, and a new In the News feature on tariffs and supply management in diary has been added. A new appendix on the "Mathematics of Tariffs" has been added following through on the numerical example from previous chapters.

Chapter 10 A new, and updated, In the News feature on B.C.'s carbon tax has been added.

Chapter 12 Tables and figures have been updated throughout this chapter.

Chapter 13 A new In the News feature discusses IKEA and its approach to cost minimization.

Chapter 16 A new In the News feature discusses lower product variety and higher prices in Canada in the context of lower competition.

Chapter 17 A new Case Study on wireless pricing and competition in Canada has been added.

Chapter 22 A new Case Study on "left digit bias"—the tendency for companies to set prices ending in 99 cents—has been added in the section on behavioural economics.

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ACKNOWLEDGMENTS

The success of each Canadian edition of *Principles of Microeconomics* and *Principles of Macroeconomics* has been due, in part, to the reviewers who helped us shape this text, edition after edition. We have benefited enormously from their advice and suggestions.

Ather H. Akbari, St. Mary's University

Iris Au, University of Toronto

Collins Ayoo, Carleton University

Rauf Azhar, University of Guelph

Keith Baxter, Bishop's University

Ugurhan G. Berkok, Queen's University

Aurelia Best, Centennial College

Menouar Boulahfa, Dawson College

Bogdan Buduru, Concordia University

Bruce Cater, Trent University

Jyh-Yaw Joseph Chen, Kwantlen Polytechnic University

Saud Choudhry, Trent University

Nancy Churchman, Carleton University

Kevin Clinton, Bank of Canada

Daria Crisan, Mount Royal University

Weili Ding, Queen's University

Wendy Doell, University of Saskatchewan

Martin Dooley, McMaster University

Peter Dungan, University of Toronto

Byron Eastman, Laurentian University

Herb Emery, University of Calgary

Pierre Fortin, University of Quebec at Montreal

Michael Francis, Carleton University

Alexander Gainer, University of Alberta

Samuel Gamtessa, University of Regina

Pierre-Pascal Gendron, Humber College

David Gray, University of Ottawa

Michael Hare, University of Toronto
Ibrahim Hayania, Seneca College
Paul Hobson, Acadia University
Hannah Holmes, McMaster University
Ernie Jacobson, Northern Alberta Institute of Technology
Troy Joseph, Carleton University
Eric Kam, Ryerson University
Steven Lehrer, Queen's University
Colin Mang, Nipissing University
Peter McCabe, McMaster University
Chris McDonnell, Malaspina University-College
Stan Miles, Thompson Rivers University
Lavinia Moldovan, Mount Royal University
Robin Neill, University of Prince Edward Island and Carleton University
Costas Nicolau, University of Manitoba
Umut Oguzoglu, University of Manitoba
Amy Peng, Ryerson University
Julien Picault, University of British Columbia Okanagan
Stephen Rakocsy, Humber College
Ashantha Ranasinghe, University of Manitoba
Neil Roberts, Kwantlen Polytechnic University
Christos Shiamptanis, Wilfrid Laurier University
Scott Skjei, Acadia University
Gregor Smith, Queen's University
Xueda Song, York University
Kien Tran, University of Lethbridge
Mike Tucker, Fanshawe College
Maurice Tugwell, Acadia University
James Wishart, College of the Rockies

Canadianizing this book has been a team effort from the very start. We would like to acknowledge the editorial, production, and marketing teams at Nelson for their professionalism, advice, and encouragement throughout the process. Deserving special attention are publisher Amie Plourde and developmental editor Katherine Goodes for helping to ensure the timely completion of our work.

Special thanks go to Bill Scarth of McMaster University, who offered invaluable advice regarding the structure and emphasis of the Canadian editions. Dr. Scarth is an award-winning teacher and author, and to ignore his advice would have been perilous indeed. His extensive comments were instrumental in helping us formulate our approach to the Canadian editions.

Our thanks to Norm Smith, Georgian College, for the technical check to ensure the accuracy of content throughout this seventh Canadian edition and the relevant supplements.

We would also like to thank our colleagues at the University of Calgary who provided invaluable informal input and useful examples and applications. We, of course, bear full responsibility for any misinterpretations and errors.

The student and instructor ancillaries are a key component of this book and we gratefully acknowledge the work of the authors:

Peter Fortura, Algonquin College
Phil Ghayad, Dawson College
Michel Mayer, Dawson College
Eric Moon, University of Toronto
Shahram Manouchehri, MacEwan University
Marc Prud'Homme, University of Ottawa
Judith Street, Mount Royal University

Finally, we are grateful to our families for their indulgence and encouragement throughout the research and writing process. Their patience and understanding are greatly appreciated.

Ronald D. Kneebone

Kenneth J. McKenzie

August 2016

CHAPTER
1

Ten Principles of Economics

LEARNING
objectives

In this chapter, you will ...

1. Learn that economics is about the allocation of scarce resources
2. Examine some of the tradeoffs that people face
3. Learn the meaning of *opportunity cost*
4. See how to use marginal reasoning when making decisions
5. Discuss how incentives affect people's behaviour
6. Consider why trade among people or nations can be good for everyone
7. Discuss why markets are a good, but not perfect, way to allocate resources
8. Learn what determines some trends in the overall economy

The word *economy* comes from the Greek word for "one who manages a household." At first, this origin might seem peculiar. But, in fact, households and economies have much in common.

A household faces many decisions. It must decide which members of the household do which tasks and what each member gets in return: Who cooks the meals? Who does the laundry? Who gets the extra dessert at dinner? Who gets to choose what TV show to watch? In short, the household must allocate its scarce resources among its various members, taking into account each member's abilities, efforts, and desires.

Like a household, a society faces many decisions. A society must decide what jobs will be done and who will do them. It needs some people to grow food, other people to make clothing, and still others to design computer software. Once society has allocated people (as well as land, buildings, and machines) to various jobs, it must also allocate the output of goods and services that they produce. It must decide who will eat caviar and who will eat potatoes. It must decide who will drive a Ferrari and who will take the bus.

scarcity
the limited nature of society's resources

The management of society's resources is important because resources are scarce. **Scarcity** means that society has limited resources and therefore cannot produce all the goods and services people wish to have. Just as each member of a household cannot get everything he or she wants, each individual in a society cannot attain the highest standard of living to which he or she might aspire.

economics
the study of how society manages its scarce resources

Economics is the study of how society manages its scarce resources. In most societies, resources are allocated not by a single central planner but through the combined actions of millions of households and firms. Economists, therefore, study how people make decisions: how much they work, what they buy, how much they save, and how they invest their savings. Economists also study how people interact with one another. For instance, they examine how the multitude of buyers and sellers of a good together determine the price at which the good is sold and the quantity that is sold. Finally, economists analyze forces and trends that affect the economy as a whole, including the growth in average income, the fraction of the population that cannot find work, and the rate at which prices are rising.

The study of economics has many facets but it is unified by several central ideas. In this chapter, we look at ten principles of economics. Don't worry if you don't understand them all at first or if you aren't completely convinced. We explore these ideas more fully in later chapters. The ten principles are introduced here just to give you an overview of what economics is all about. Consider this chapter a "preview of coming attractions."

1-1 How People Make Decisions

There is no mystery to what an economy is. Whether we are talking about the economy of Vancouver, of Canada, or of the whole world, an economy is just a group of people interacting with one another as they go about their lives. Because the behaviour of an economy reflects the behaviour of the individuals who make up the economy, we start our study of economics with four principles of individual decision making.

1-1a Principle #1: People Face Tradeoffs

You may have heard the old saying, "There ain't no such thing as a free lunch." Grammar aside, there is much truth to this adage. To get one thing that we like,

we usually have to give up another thing that we like. Making decisions requires trading off one goal against another.

Consider a student who must decide how to allocate her most valuable resource—her time. She can spend all of her time studying economics, spend all of it studying psychology, or divide it between the two fields. For every hour she studies one subject, she gives up an hour she could have used studying the other. And for every hour she spends studying, she gives up an hour that she could have spent napping, bike riding, watching TV, or working at her part-time job for some extra spending money.

Or consider parents deciding how to spend their family income. They can buy food, clothing, or a family vacation. Or they can save some of the family income for retirement or the children's college or university education. When they choose to spend an extra dollar on one of these goods, they have one less dollar to spend on some other good.

When people are grouped into societies, they face different kinds of tradeoffs. One classic tradeoff is between "guns and butter." The more society spends on national defence and security (guns) to protect its shores from foreign aggressors, the less it can spend on consumer goods (butter) to raise the standard of living at home. Also important in modern society is the tradeoff between a clean environment and a high level of income. Laws that require firms to reduce pollution raise the cost of producing goods and services. Because of the higher costs, these firms end up earning smaller profits, paying lower wages, charging higher prices, or some combination of these three. Thus, while pollution regulations give us the benefit of a cleaner environment and the improved health that comes with it, they have the cost of reducing the incomes of the regulated firms' owners, workers, and customers.

Another tradeoff society faces is between efficiency and equity. **Efficiency** means that society is getting the maximum benefits from its scarce resources. **Equity** means that the benefits of those resources are distributed fairly among society's members. In other words, efficiency refers to the size of the economic pie, and equity refers to how the pie is divided into individual slices.

efficiency
the property of society getting the most it can from its scarce resources

equity
the property of distributing economic prosperity fairly among the members of society

When government policies are designed, these two goals often conflict. Consider, for instance, policies aimed at achieving a more equal distribution of economic well-being. Some of these policies, such as the welfare system or Employment Insurance, try to help those members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. Although these policies have the benefit of achieving greater equity, they have a cost in terms of reduced efficiency. When the government redistributes income from the rich to the poor, it reduces the reward for working hard; as a result, people work less and produce fewer goods and services. In other words, when the government tries to cut the economic pie into more equal slices, the pie gets smaller.

Recognizing that people face tradeoffs does not by itself tell us what decisions they will or should make. A student should not abandon the study of psychology just because doing so would increase the time available for the study of economics. Society should not stop protecting the environment just because environmental regulations reduce our material standard of living. The poor should not be ignored just because helping them distorts work incentives. Nonetheless, people are likely to make good decisions only if they understand the options that they have available. Our study of economics, therefore, starts by acknowledging life's tradeoffs.

1-1b Principle #2: The Cost of Something Is What You Give Up to Get It

Because people face tradeoffs, making decisions requires comparing the costs and benefits of alternative courses of action. In many cases, however, the cost of an action is not as obvious as it might first appear.

Consider the decision whether to go to college or university. The main benefits are intellectual enrichment and a lifetime of better job opportunities. But what are the costs? To answer this question, you might be tempted to add up the money you spend on tuition, books, and room and board. Yet this total does not truly represent what you give up to spend a year in college or university.

There are two problems with the calculation. First, it includes some things that are not really costs of going to college or university. Even if you quit school, you would need a place to sleep and food to eat. Room and board are costs of going to college or university only to the extent that they are more expensive there than elsewhere. Second, this calculation ignores the largest cost of going to college or university—your time. When you spend a year listening to lectures, reading textbooks, and writing papers, you cannot spend that time working at a job. For most students, the wages given up to attend school are the largest single cost of their education.

opportunity cost
whatever must be given up to obtain some item

The **opportunity cost** of an item is what you give up to get that item. When making any decision, decision makers should be aware of the opportunity costs that accompany each possible action. In fact, they usually are. College or university-age athletes who can earn millions if they drop out of school and play professional sports are well aware that their opportunity cost of a postsecondary education is very high. It is not surprising that they often decide that the benefit of this education is not worth the cost. Remember, an opportunity cost is an opportunity lost.

1-1c Principle #3: Rational People Think at the Margin

Economists normally assume that people are rational. In the final chapter of this book (Chapter 22) we examine some insights from behavioural economics, which considers the implications of systematic departures from rationality. However, for the most part the assumption that people are rational serves us very well.

rational people
those who systematically and purposefully do the best they can to achieve their objectives

Rational people systematically and purposefully do the best they can to achieve their objectives, given the opportunities they have. As you study economics, you will encounter firms that decide how many workers to hire and how much of their product to manufacture and sell to maximize profits. You will also encounter individuals who decide how much time to spend working and what goods and services to buy with the resulting income to achieve the highest possible level of satisfaction.

Rational people know that decisions in life are rarely black and white, but usually involve shades of grey. At dinnertime, the decision you face is not "Should I fast or eat like a glutton?" More likely, you will be asking yourself "Should I take that extra spoonful of mashed potatoes?" When exams roll around, your decision is not between blowing them off or studying 24 hours a day, but whether to spend an extra hour reviewing your notes instead of watching TV. Economists use the term **marginal changes** to describe small incremental adjustments to an existing plan of action. Keep in mind that "margin" means "edge," so marginal changes are adjustments around the edges of what you are doing. Rational people often make decisions by comparing *marginal benefits* and *marginal costs.*

marginal changes
small incremental adjustments to a plan of action

For example, suppose you are considering calling a friend on your cell phone. You decide that talking with her for 10 minutes would give you a benefit that you value at about $7. Your cell phone service costs you $40 per month plus $0.50 per

FYI

The Opportunity Cost of Gasoline

The opportunity cost of an item is what you give up to get it. As discussed earlier, out of pocket monetary costs can be a misleading indicator of opportunity cost. For example, consider the opportunity cost of gasoline. The price of gasoline has increased quite significantly over the years. For example, the average price of gasoline in Ontario rose from about 56 cents per litre in 1997 to over $1.28 in 2014, with several ups and downs in between. This represents an increase of almost 130 percent over this 17-year period.

However, this is misleading. Gasoline is not something that is consumed directly, but rather is used to drive your car. It is better to think of the price of gasoline in terms of how much it costs per kilometre driven. To do this we need to take account of how the fuel efficiency of cars has changed over this period. In 1997 the fuel efficiency of the average North American car was about 8.5 kilometres per litre (KPL). By 2014 this had increased to 10.3 KPL. So it took about 17.5 percent less gasoline to drive a car in 2014 than it did in 1997.

But this is not all. In order to buy the gasoline you need money. To earn that money you need to work. A useful way to think about the opportunity cost of gasoline, or any good for that matter, is in terms of the amount of time you have to work in order to pay for it. In this regard, consider the number of minutes you need to work in order to pay for gasoline on a per-kilometre basis. Let's call this minutes worked per kilometre driven (MWPKD). The average hourly wage in Ontario in 1997 was about $15.60 per hour; in 2014 it was $24.50, an increase of 57 percent. To calculate MWPKD, take the price of gasoline and divide it by the product of the wage rate (measured in dollars per minute, so $15.60 per hour is 26 cents per minute in 1997) and average fuel economy. For 1997 this gives MWPKD $= .56/(.26 \times 8.5) = .2533$. So, in 1997, in order to pay for the gasoline required to drive a car one kilometre, an average individual in Ontario had to work .2533 minutes, or 15.2 seconds. In 2014 the MWPKD was .3043, or 18 seconds. So, the opportunity cost of gasoline in 2014 measured in terms of the number of seconds of work needed to drive one kilometre was 18 seconds compared to 15 seconds in 1997! While the price of gasoline at the pump has indeed increased significantly since 1997, fuel economy has increased as well, as have wages, keeping the opportunity cost of gasoline relatively constant. Figure 1.1 shows MWPKD for Ontario for every year from 1997 to 2014.

The above calculations are based on fleet averages for cars in North America. Of course if you drive a more fuel-efficient car, or earn a higher than average wage, you have to work less to pay for the gasoline required to drive your car. For example, the hybrid Toyota Prius gets about 21 KPL, compared to the 2014 fleet average of 10.3. If you drive a Prius you have to work just under nine seconds per kilometre driven to pay for the gasoline. On the other hand, if you drive a Ford F150 truck (9.4 KPL), you have to work almost 20 seconds.

On his blog, Ed Dolan has undertaken similar calculations for the United States. Fuel economy is the same in the two countries, as we drive basically the same vehicles. However, gasoline prices are lower in the United States (due largely to lower taxes) and average wages are higher. For 2014 Dolan calculates that, on average, it costs a little under 7 seconds of work in the United States to pay for a kilometre of driving, significantly less than the 18 seconds in Canada.

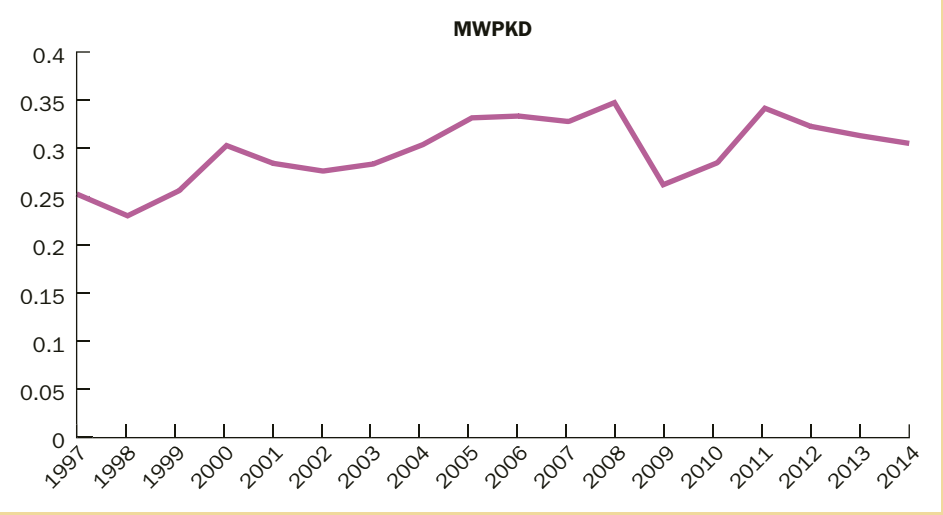

FIGURE 1.1

Minutes Worked per Kilometre Driven

minute for whatever calls you make. You usually talk for 100 minutes a month, so your total monthly bill is $90 ($0.50 per minute times 100 minutes, plus the $40 fixed fee). Under these circumstances, should you make the call? You might be tempted to reason as follows: "Because I pay $90 for 100 minutes of calling each month, the average minute on the phone costs me $0.90. So a 10-minute call costs $9. Because that $9 cost is greater than the $7 benefit, I am going to skip the call." That conclusion is wrong, however. Although the *average* cost of a 10-minute call is $9, the *marginal* cost—the amount your bill increases if you make the extra call—is only $5. You will make the right decision only by comparing the marginal benefit and the marginal cost. Because the marginal benefit of $7 is greater than the marginal cost of $5 ($.50 \times 10 = \$5$), you should make the call. This is a principle that people innately understand: Cell phone users with unlimited minutes (that is, minutes that are free at the margin) are often prone to make long and frivolous calls.

Thinking at the margin works for business decisions as well. Consider an airline deciding how much to charge passengers who fly standby. Suppose that flying a 200-seat plane across Canada costs the airline $100 000. In this case, the average cost of each seat is $100 000/200, which is $500. One might be tempted to conclude that the airline should never sell a ticket for less than $500. Actually, a rational airline can often find ways to raise its profits by thinking at the margin. Imagine that a plane is about to take off with 10 empty seats, and a standby passenger is waiting at the gate willing to pay $300 for a seat. Should the airline sell the ticket? Of course it should. If the plane has empty seats, the cost of adding one more passenger is tiny. Although the *average* cost of flying a passenger is $500, the *marginal* cost is merely the cost of the bag of peanuts and can of soda that the extra passenger will consume. As long as the standby passenger pays more than the marginal cost, selling him a ticket is profitable.

Marginal decision making can help explain some otherwise puzzling economic phenomena. Here is a classic question: Why is water so cheap, while diamonds are so expensive? Humans need water to survive, while diamonds are unnecessary; but, for some reason, people are willing to pay much more for a diamond than for a cup of water. The reason is that a person's willingness to pay for a good is based on the marginal benefit that an extra unit of the good will yield. The marginal benefit, in turn, depends on how many units a person already has. Water is essential but the marginal benefit of an extra cup is small because water is plentiful. By contrast, no one needs diamonds to survive, but because diamonds are so rare people consider the marginal benefit of an extra diamond to be large.

A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost. This principle can explain why people use their cell phones as much as they do, why airlines are willing to sell a ticket below average cost, and why people are willing to pay more for diamonds than for water. It can take some time to get used to the logic of marginal thinking, but the study of economics will give you ample opportunity to practise.

1-1d Principle #4: People Respond to Incentives

incentive
something that induces a person to act

An **incentive** is something (such as the prospect of a punishment or a reward) that induces a person to act. Because rational people make decisions by comparing costs and benefits, they respond to incentives. You will see that incentives play a central role in the study of economics. One economist went so far as to suggest that the entire field could be summarized simply: "People respond to incentives. The rest is commentary."

Incentives are crucial to analyzing how markets work. For example, when the price of an apple rises, people decide to eat fewer apples. At the same time, apple orchards decide to hire more workers and harvest more apples. In other words, a higher price in a market provides an incentive for buyers to consume less and an incentive for sellers to produce more. As we will see, the influence of prices on the behaviour of consumers and producers is crucial for how a market economy allocates scarce resources.

Public policymakers should never forget about incentives. Many policies change the costs or benefits that people face and, as a result, alter their behaviour. A tax on gasoline, for instance, encourages people to drive smaller, more fuel-efficient cars. That is one reason why people drive smaller cars in Europe, where gasoline taxes are high, than in Canada, where gasoline taxes are lower. A gasoline tax also encourages people to carpool, take public transportation, and live closer to where they work. If the tax were larger, more people would drive hybrid cars, and if it were large enough, they would switch to electric cars.

When policymakers fail to consider how their policies affect incentives, they often end up with unintended consequences. For example, consider public policy regarding auto safety. Today all cars have seat belts, but that was not true 50 years ago. In the 1960s, Ralph Nader's book *Unsafe at Any Speed* generated much public concern over auto safety. Parliament responded with laws requiring seat belts as standard equipment on new cars.

How does a seat belt law affect auto safety? The direct effect is obvious: When a person wears a seat belt, the probability of surviving an auto accident rises. But that's not the end of the story, because the law also affects behaviour by altering incentives. The relevant behaviour here is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver's time and energy. When deciding how safely to drive, rational people compare the marginal benefit from safer driving to the marginal cost. As a result, they drive more slowly and carefully when the benefit of increased safety is high. For example, when road conditions are icy, people drive more attentively and at lower speeds than they do when road conditions are clear.

Consider how a seat belt law alters a driver's cost–benefit calculation. Seat belts make accidents less costly because they reduce the likelihood of injury or death. In other words, seat belts reduce the benefits to slow and careful driving. People respond to seat belts as they would to an improvement in road conditions—by driving faster and less carefully. The result of a seat belt law, therefore, is a larger number of accidents. The decline in safe driving has a clear, adverse impact on pedestrians, who are more likely to find themselves in an accident but (unlike the drivers) don't have the benefit of added protection.

At first, this discussion of incentives and seat belts might seem like idle speculation. Yet in a classic 1975 study, economist Sam Peltzman argued that auto-safety laws have had many of these effects. According to Peltzman's evidence, these laws produce both fewer deaths per accident and more accidents. He concluded that the net result is little change in the number of driver deaths and an increase in the number of pedestrian deaths.

Peltzman's analysis of auto safety is an offbeat and controversial example of the general principle that people respond to incentives. When analyzing any policy, we must consider not only the direct effects but also the indirect effects that work through incentives. If the policy changes incentives, it will cause people to alter their behaviour.

IN THE **news**

Even Criminals Respond to Incentives

Principle #4, people respond to incentives, is at the core of the study of economics. As the following article explains, this principle applies to all sorts of activities, even of the criminal kind.

Risk, Reward and the Economics of the Criminal Mind

By Todd Hirsch

Last week's *Economist* magazine carried a headline reading, "The Curious Case of the Fall in Crime." It seems that all around the industrialized world—including Canada—all kinds of criminal activity are on the decline. Contrary to the belief that evil thugs lurk around every corner, we are actually safer than we have been in decades. In today's underground economy, identity theft makes better economic sense than stealing a flat-screen television.

The magazine's editorial offers only guesses as to why crime rates are falling. Aging demographics may play a role, along with better theft-prevention technologies. Stiffer punishment and "get tough on crime" policies might make for good political posturing, but they seem to have little impact: Crime rates are falling in countries where sentencing has become tougher as well as where it has been loosened.

The Economist failed to mention the most obvious reason for the change: economic incentives. Thieves are simply doing what most of us do every day: They are responding to market signals.

This is particularly true of property crimes such as residential break-and-enter, car theft and armed robbery. The possible payoff for stealing from a home is dwindling. What is there worth taking? Electronics are increasingly less valuable—a computer or a television in the 1980s would have been worth thousands of

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dollars on the street; now they would fetch a few hundred bucks. Why buy a stolen iPod dock out of the back of some guy's truck when you can get a new one for less than $100?

Car theft is down dramatically, too. According to Statistics Canada, car theft in Ontario plunged to 141 per 100,000 people last year, down from 443 in 1998. Better technology, car alarm systems and anti-theft devices have deterred most would-be thieves. And lower-priced cars without car alarms probably are not worth stealing anyway. The bad guys aren't less bad, they're just good economists.

Muggings and purse snatchings are increasingly less common as well. But let's not overthink the reasons why fewer thieves are snatching purses. It has nothing to do with the culprit's age or job situation. Whether there was a father present in the thief's childhood or whether he or she played violent video games are irrelevant. The reason is that there's just not much of value inside purses or wallets anymore. Cash has been largely replaced by debit and credit cards, and as long as the PIN is secure, the thief gets away with nothing more than plastic cards and chewing gum. Cellphones are more costly, but stolen ones are difficult to wipe and resell.

Criminals, like all of us, respond to market signals. If the potential payoff for any activity is too low, we weigh the risks and decide it isn't worth it. For noncriminals, the question isn't "Should I steal this car?" but something along the lines of "Should I put in new bathroom tile before I list my house?" People are quite good at reading and responding to market signals.

Still, we shouldn't think that poor economic incentives are making crime go away. Crime is simply morphing. Traditional crime statistics tend to focus on activities such as robbery, property theft and murder. Fewer long-term trend statistics are available for crimes that are doubtless increasing, such as identity theft and cybercrime. Not only are they potentially more lucrative, they are global in scope and much more difficult to track.

Thieves are also getting smarter, using technology for evil deeds. Internet scams abound, and bank-card skimming and credit-card fraud is a serious problem. Banks have had to fight back with their own technology and it has been costly.

Economic incentives play a huge role motivating us in almost everything we do. Certain actions are no doubt spurred by altruism and generosity, such as helping our neighbour shovel snow or donating to charity (although we still want the tax receipt). Weighing the financial incentives against the potential risks is the basis of our economy. Criminals may not know they're doing it, but they're just responding to market signals—and doing a good job of it.

Source: "Risk, Reward and the Economics of the Criminal Mind," by Todd Hirsch, August 1, 2013, *The Globe and Mail*. Reproduced by permission of the author.

QUICK **Quiz**

Describe an important tradeoff you recently faced. • Give an example of some action that has both a monetary and nonmonetary opportunity cost. • Describe an incentive your parents and/or guardians offered to you in an effort to influence your behaviour.

1-2 How People Interact

The first four principles discussed how individuals make decisions. As we go about our lives, many of our decisions affect not only ourselves but other people as well. The next three principles concern how people interact with one another.

1-2a Principle #5: Trade Can Make Everyone Better Off

You may have heard on the news that the Americans are our competitors in the world economy. In some ways this is true, for Canadian and U.S. firms do produce many of the same goods. BlackBerry and Apple compete for the same customers in the market for smart phones. Inniskillin and Gallo compete for the same customers in the market for wine.

Yet it is easy to be misled when thinking about competition among countries. Trade between Canada and the United States is not like a sports contest, where one side wins and the other side loses. In fact, the opposite is true: Trade between two countries can make each country better off.

To see why, consider how trade affects your family. When a member of your family looks for a job, he or she competes against members of other families who are looking for jobs. Families also compete against one another when they go shopping because each family wants to buy the best goods at the lowest prices. In a sense, each family in an economy competes with all other families.

Despite this competition, your family would not be better off isolating itself from all other families. If it did, your family would need to grow its own food, make its own clothes, and build its own home. Clearly, your family gains much from its ability to trade with others. Trade allows each person to specialize in the activities he or she does best, whether it is farming, sewing, or home building. By trading with others, people can buy a greater variety of goods and services at lower cost.

Countries as well as families benefit from the ability to trade with one another. Trade allows countries to specialize in what they do best and to enjoy a greater variety of goods and services. The Americans, as well as the French and the Egyptians and the Brazilians, are as much our partners in the world economy as they are our competitors.

1-2b Principle #6: Markets Are Usually a Good Way to Organize Economic Activity

The collapse of communism in the Soviet Union and Eastern Europe in the 1980s was one of the last century's most important changes. Communist countries operated on the premise that government officials were in the best position to allocate the economy's scarce resources. These central planners decided what goods and services were produced, how much was produced, and who produced and consumed these goods and services. The theory behind central planning was that only the government could organize economic activity in a way that promoted economic well-being for the country as a whole.

Most countries that once had centrally planned economies have abandoned this system and are trying to develop market economies. In a **market economy**, the decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions.

market economy
an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services