

EIGHTH
CANADIAN
EDITION

PRINCIPLES OF MICRO ECONOMICS

MANKIW KNEEBONE MCKENZIE



PRINCIPLES OF MICROECONOMICS: A GUIDED TOUR

PART 1: INTRODUCTION

- Chapter 1** Ten Principles of Economics ————— *The study of economics is guided by a few big ideas.*
- Chapter 2** Thinking Like an Economist ————— *Economists view the world as both scientists and policymakers.*
- Chapter 3** Interdependence and the Gains from Trade ————— *The theory of comparative advantage explains how people benefit from economic interdependence.*

PART 2: SUPPLY AND DEMAND I: HOW MARKETS WORK

- Chapter 4** The Market Forces of Supply and Demand ————— *How does the economy coordinate interdependent economic actors? Through the market forces of supply and demand.*
- Chapter 5** Elasticity and Its Application
- Chapter 6** Supply, Demand, and Government Policies
- *The tools of supply and demand are put to work to examine the effects of various government policies.*

PART 3: SUPPLY AND DEMAND II: MARKETS AND WELFARE

- Chapter 7** Consumers, Producers, and the Efficiency of Markets
- Chapter 8** Application: The Costs of Taxation
- Chapter 9** Application: International Trade
- *Why is the equilibrium of supply and demand desirable for society as a whole? The concepts of consumer and producer surplus explain the efficiency of markets, the costs of taxation, and the benefits of international trade.*

PART 4: THE ECONOMICS OF THE PUBLIC SECTOR

- Chapter 10** Externalities
- Chapter 11** Public Goods and Common Resources
- *Market outcomes are not always efficient, and governments can sometimes remedy market failure.*
- Chapter 12** The Design of the Tax System ————— *To fund programs, governments raise revenue through their tax systems, which are designed with an eye toward balancing efficiency and equity.*

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.

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PRINCIPLES OF MICRO ECONOMICS

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Principles of Microeconomics, Eighth Canadian Edition

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

VP, Product Solutions, K–20:
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Director, Quantitative Publishing:
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Publisher:
Katherine Baker-Ross

Marketing Manager:
Marcia Siekowski

Technical Reviewer:
Racquel Lindsay

Content Manager:
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Photo and Permissions Researcher:
Julie Pratt

Senior Production Project Manager:
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Production Service:
MPS Limited

Copy Editor:
Kelli Howey

Proofreader:
MPS Limited

Indexer:
Jerry Ralya

Design Director:
Ken Phipps

Post-secondary Design PM:
Pamela Johnston

Cover Design:
John Montgomery

Cover Image:
AstroStar/Shutterstock

Compositor:
MPS Limited

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Adapted from *Principles of Microeconomics*, Eighth Edition, by N. Gregory Mankiw, published by Cengage Learning. Copyright © 2018 by Cengage Learning.

Printed and bound in Canada
1 2 3 4 22 21 20 19

For more information contact
Nelson Education Ltd., 1120 Birchmount Road,
Toronto, Ontario, M1K 5G4. Or you can visit our
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Library and Archives Canada Cataloguing in Publication

Title: Principles of microeconomics /
N. Gregory Mankiw (Harvard University), Ronald D.
Kneebone (University of Calgary), Kenneth J. McKenzie
(University of Calgary).

Other titles: Principles of micro economics

Names: Mankiw, N. Gregory, author. |
Kneebone, Ronald D. (Ronald David), author. |
McKenzie, Kenneth J. (Kenneth James), author.

Description: Eighth Canadian edition. | Includes index. |
Previously published: Toronto, Ontario: Nelson
Education, 2016.

Identifiers: Canadiana (print) 20190150858 | Canadiana
(ebook) 20190150890 | ISBN 9780176872823 (softcover) |
ISBN 9780176888060 (PDF)

Subjects: LCSH: Microeconomics—Textbooks. | LCGFT:
Textbooks.

Classification: LCC HB172 .M36 2019 | DDC 338.5—dc23

ISBN-13: 978-0-17-687282-3
ISBN-10: 0-17-687282-5

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

ABOUT THE AUTHORS



N. Gregory Mankiw is Professor of Economics at Harvard University. As a student, he studied economics at Princeton University and MIT. As a teacher, he has taught macroeconomics, microeconomics, statistics, and principles of economics. He even spent one summer long ago as a sailing instructor on Long Beach Island.

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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 eighth 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 eighth 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 gains 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.

CHAPTER 1
LEARNING OBJECTIVES

Ten Principles of Economics

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 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.

CHAPTER 1 TEN PRINCIPLES OF ECONOMICS 11

outcomes that, in many cases, maximize the aggregate well-being of society as a whole.

Smith's insight has an important corollary: When the government prevents prices from adjusting naturally to supply and demand, it impedes the invisible hand's ability to coordinate the millions of households and firms that make up the economy. This corollary explains why taxes adversely affect the allocation of resources. They distort prices and thus the decisions of households and firms. It also explains the harm that can be caused by policies that directly control prices, such as rent control. And it explains the failure of communism. In communist countries, prices were not determined in the marketplace but were dictated by central planners. These planners lacked the necessary information about consumers' tastes and producers' costs, which in a market economy is reflected in prices. Central planners failed because they tried to run the economy with one hand tied behind their backs—the invisible hand of the marketplace.

case study **Adam Smith Would Have Loved Uber**

You probably have never lived in a centrally planned economy, but if you have ever tried to hail a cab in a major city you likely have experienced a highly regulated market. In many cities, the local government imposes strict controls in the market for taxis. The rules usually go well beyond regulation of insurance and safety. For example, the government may limit entry into the market by approving only a certain number of taxi medallions or permits. It may determine the prices that taxis are allowed to charge. The government uses its police powers—that is, the threat of fines or jail time—to keep unauthorized drivers off the streets and to prevent all drivers from charging unauthorized prices.

Recently, however, this highly controlled market has been invaded by a disruptive force: Uber. Launched in 2009, this company provides an app for smartphones that connects passengers and drivers. Because Uber cars do not roam the streets looking for taxi-hailing pedestrians, they technically are not taxis and so are not subject to the same regulations. But they offer much the same service. Indeed, rides from Uber cars often are more convenient. On a cold and rainy day, who wants to stand on the side of the road waiting for an empty cab to drive by? It is more pleasant to remain inside, use your smartphone to arrange for a ride, and stay warm and dry until the car arrives.

Uber cars often charge less than taxis, but not always. Uber allows drivers to raise their prices significantly when there is a surge in demand, such as during a sudden rainstorm or late on New Year's Eve, when numerous tipsy partiers are looking for a safe way to get home. By contrast, regulated taxis are typically prevented from surge pricing.

Not everyone is fond of Uber. Drivers of traditional taxis complain that this new competition eats into their source of income. This is hardly a surprise: Suppliers of goods and services usually dislike new competitors. But vigorous competition among producers makes a market work well for consumers.

That is why economists love Uber. A 2014 survey of several dozen prominent economists asked whether car services such as Uber increased consumer well-being. Yes, said every single economist. The economists were also asked whether surge pricing increased consumer well-being. Yes, said 85 percent of them. Surge pricing makes consumers pay more at times, but because Uber

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.

Ask the Experts

Rent Control

"Local ordinances that limit rent increases for some rental housing units have had a positive impact over the past three decades on the amount and quality of broadly affordable rental housing in cities that have used them."

What do economists say?

Response	Percentage
Disagree	95%
Uncertain	4%
Agree	1%

Source: IGM Economic Experts Panel, February 7, 2012.
Figure © 2018 Cengage Learning.

New "Ask the Experts" Boxes Feature Opinions from the World's Most Prominent Economists. This timely learning feature highlights the IGM Economics Experts Panel, a longitudinal survey of several dozens of the world's most prominent economists. Every few weeks these experts review a proposition and respond whether they agree with it, disagree with it, or are uncertain. The insights from this feature demonstrate to your students situations when economists are united, when they are divided, and when they simply don't know what to think.

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.

TABLE 1.1

Ten Principles of Economics

How People Make Decisions

- #1: People face tradeoffs.
- #2: The cost of something is what you give up to get it.
- #3: Rational people think at the margin.
- #4: People respond to incentives.

How People Interact

- #5: Trade can make everyone better off.
- #6: Markets are usually a good way to organize economic activity.
- #7: Governments can sometimes improve market outcomes.

How the Economy as a Whole Works

- #8: A country's standard of living depends on its ability to produce goods and services.
- #9: Prices rise when the government prints too much money.
- #10: Society faces a short-run tradeoff between inflation and unemployment.

“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.

FYI

The Legacy of Adam Smith and David Ricardo

Economists have long understood the principle of comparative advantage. Here is how the great economist Adam Smith put the argument: It is a maxim of every prudent master of a family, never to attempt to make at home what it will cost him more to make than to buy. The tailor does not attempt to make his own shoes, but buys them of the shoemaker. The shoemaker does not attempt to make his own clothes but employs a tailor. The farmer attempts to make neither the one nor the other, but employs those different artificers. All of them find it in their interest to employ their whole industry in a way in which they have some advantage over their neighbours, and to purchase with a part of its produce, or what is the same thing, with the price of part of it, whatever else they have occasion for.

This quotation is from Smith's 1776 book *An Inquiry into the Nature and Causes of the Wealth of Nations*, which was a landmark in the analysis of trade and economic interdependence.

Smith's book inspired David Ricardo, a millionaire stockbroker, to become an economist. In his 1817 book *Principles of Political Economy*

and *Taxation*, Ricardo developed the principle of comparative advantage as we know it today. His defence of free trade was not a mere academic exercise. Ricardo put his economic beliefs to work as a member of the British Parliament, where he opposed the Corn Laws, which restricted the import of grain.

The conclusions of Adam Smith and David Ricardo on the gains from trade have held up well over time. Although economists often disagree on questions of policy, they are united in their support of free trade. Moreover, the central argument for free trade has not changed much in the past two centuries. Even though the field of economics has broadened its scope and refined its theories since the time of Smith and Ricardo, economists' opposition to trade restrictions is still based largely on the principle of comparative advantage.



© David Ricardo

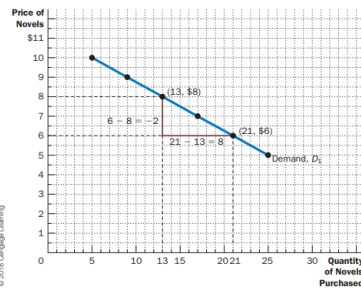


FIGURE 2A.5

Calculating the Slope of a Line

To calculate the slope of the demand curve, we can look at the changes in the *x*- and *y*-coordinates as we move from the point (21 novels, \$6) to the point (13 novels, \$8). The slope of the line is the ratio of the change in the *y*-coordinate (−2) to the change in the *x*-coordinate (+8), which equals −1/4.

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, identify 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. Stricter 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. These 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 now 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 newer proof 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 overlook 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 reset.

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



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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, 2011. The above text has been reproduced by permission of the author.

“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 to skip in their lectures.

the consumption of these resources, this potential equilibrium gets to the benefit of a cleaner environment and the improved health that comes with it, they've 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.

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. Though they achieve greater equality, these policies may reduce efficiency. When the government distributes income from the rich to the poor, it reduces the reward for working

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

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.

Quick Quizzes 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.

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.

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 and interdependence 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 | marginal changes, p. 5 | market power, p. 12 |
| economics, p. 2 | incentive, p. 6 | productivity, p. 13 |
| efficiency, p. 3 | market economy, p. 10 | inflation, p. 14 |
| equity, p. 3 | property rights, p. 12 | business cycle, p. 15 |
| opportunity cost, p. 4 | market failure, p. 12 | |
| rational people, p. 4 | externality, p. 15 | |

CHAPTER 8 APPLICATION: THE COSTS OF TAXATION 189

KEY concepts

deadweight loss, p. 176 marginal cost of public funds, p. 182 marginal benefit of public funds, p. 187

QUESTIONS FOR REVIEW

- What happens to consumer and producer surplus when the sale of a good is taxed? How does the change in consumer and producer surplus compare to the tax revenue? Explain.
- Draw a supply-and-demand diagram with a tax on the sale of the good. Show the deadweight loss. Show the tax revenue.
- How do the elasticities of supply and demand affect the deadweight loss of a tax? Why do they have this effect?
- Why do experts disagree about whether labour taxes have small or large deadweight losses?
- What happens to the deadweight loss and tax revenue when a tax is increased?
 - it increases by more than 50 percent
 - the answer depends on whether supply or demand is more elastic.

QUICK CHECK multiple choice

- In which of the following circumstances does a tax on a good have a deadweight loss?
 - the reduction in consumer and producer surplus is greater than the tax revenue
 - the tax revenue is greater than the reduction in consumer and producer surplus
 - the reduction in consumer surplus is greater than the reduction in producer surplus
 - the reduction in producer surplus is greater than the reduction in consumer surplus
- Jane pays Chuck \$50 to mow her lawn every week. When the government levies a moving tax of \$10 on Chuck, he raises his price to \$60. Jane continues to hire him at the higher price. What is the change in producer surplus, change in consumer surplus, and deadweight loss?
 - \$0, \$0, \$10
 - \$0, -\$10, \$0
 - +\$10, -\$10, \$10
 - \$10, -\$10, \$0
- Eggs have a supply curve that is linear and upward sloping and a demand curve that is linear and downward sloping. If a tax of 2 cents per egg is increased to 3 cents, what happens to the deadweight loss of the tax?
 - it increases by less than 50 percent and may even decline
 - it increases by exactly 50 percent
 - it increases by more than 50 percent
 - the answer depends on whether supply or demand is more elastic.
- The Laffer curve illustrates that, in some circumstances, the government can reduce a tax on a good and increase which of the following?
 - deadweight loss
 - government's tax revenue
 - equilibrium quantity
 - price paid by consumers
- If a policymaker wants to raise revenue by taxing goods while minimizing the deadweight losses, he should look for goods with ____ elasticities of demand and ____ elasticities of supply.
 - small, small
 - small, large
 - large, small
 - large, large

PROBLEMS AND applications

- The market for pizza is characterized by a downward-sloping demand curve and an upward-sloping supply curve.
 - Draw the competitive market equilibrium. Label the price, quantity, consumer surplus, and producer surplus. Is there any deadweight loss? Explain.

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 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 Eighth Canadian Edition

The eighth 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 a previous edition, responding to reviewers who requested additional but unobtrusive mathematics support, we 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). This is continued in the eighth Canadian 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. The all-new “Ask the Experts” boxes feature opinions from the world’s most prominent economists. The insights from this feature demonstrate to your students situations when economists are united, when they are divided, and when they simply don’t know what to think.

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

Chapter 1 A new case study on crosswalk countdown signals to illustrate principle number 4: people respond to incentives.

Chapter 2 A new Graphing Functions section in the appendix.

Chapter 4 A new In the News feature on Tesla and the Canadian town of Cobalt, Ontario. A new case study on marijuana legalization and black markets.

Chapter 6 An updated discussion on the minimum wage, including a new In the News feature.

Chapter 7 An expanded discussion of the nature of equilibrium in competitive markets, focusing on the coordinating role of markets. A new case study on Uber and consumer surplus and a related In the News feature on the way Taylor Swift sells online concert tickets.

Chapter 8 Major changes emphasizing the relationship between DWL and the behavioural shrinkage in the tax base. New discussion of the marginal cost of public funds, including a case study based on Canadian taxes. More emphasis on the tradeoffs governments make in determining how “big” government should be.

Chapter 9 Inclusion of a general discussion of globalization with a new In the News feature. An enhanced discussion of the “winners” and “losers” from trade, and a brief discussion of the politics of free trade.

Chapter 10 A new case study on climate policy in Canada. A new In the News feature on some externalities associated with marijuana.

Chapter 11 A new section expanding on the difference between public and private goods. A new case study on the elimination of the tolls on Vancouver’s Port Mann Bridge.

Chapter 12 Tables and figures updated throughout this chapter. Expanded discussion on the incidence of corporate taxes in Canada.

Chapter 13 A new In the News feature discussing the implications of artificial intelligence (AI) on the future of work.

Chapter 17 A new In the News feature on the “athlete’s dilemma,” applying game theory to doping in sports.

Chapter 18 Updated case study on productivity and wages in Canada.

Chapter 19 Updated case study on the education wage gap. Updated case study on the gender wage gap.

Chapter 20 Expanded discussion of measuring poverty in Canada.

Instructor Resources

The **Nelson Education Teaching Advantage (NETA)** program delivers research-based instructor resources that promote student engagement and higher-order thinking to enable the success of Canadian students and educators. Visit Nelson Education’s **Inspired Instruction** website at nelson.com/inspired/ to find out more about NETA.

The following instructor resources have been created for Mankiw, *Principles of Microeconomics*, Eighth Canadian Edition. Access these ultimate tools for customizing lectures and presentations at nelson.com/instructor.

NETA Test Bank

This resource was written by Angela Trimarchi, Wilfrid Laurier University. It includes over 2800 multiple choice questions written according to NETA guidelines for effective construction and development of higher-order questions. The technical check was performed by Ross Meacher. Also included are approximately 340 true/false and 170 short-answer questions, as well as 120 problems.

The NETA Test Bank is available in a new, cloud-based platform. **Nelson Testing Powered by Cognero®** is a secure online testing system that allows instructors to author, edit, and manage test bank content from anywhere Internet access is available. No special installations or downloads are needed, and the desktop-inspired interface, with its drop-down menus and familiar, intuitive tools, allows instructors to create and manage tests with ease. Multiple test versions can be created in an instant, and content can be imported or exported into other systems. Tests can be delivered from a learning management system, the classroom, or wherever an instructor chooses. Nelson Testing Powered by Cognero for Mankiw, *Principles of Microeconomics*, Eighth Canadian Edition, can be accessed through nelson.com/instructor.



NETA PowerPoint

Microsoft® PowerPoint® lecture slides for every chapter have been created by Marc Prud'Homme, University of Ottawa. There is an average of 35–45 slides per chapter, many featuring key figures, tables, and photographs from Mankiw, *Principles of Microeconomics*, Eighth Canadian Edition. These slides also include instructor notes of suggested classroom activities and links to videos and news articles for classroom discussion. NETA principles of clear design and engaging content have been incorporated throughout, making it simple for instructors to customize the deck for their courses.

Image Library

This resource consists of digital copies of figures, short tables, and photographs used in the book. Instructors may use these jpegs to customize the NETA PowerPoint or create their own PowerPoint presentations.

Polling Questions

Another valuable resource for instructors are polling questions created specifically for *Principles of Microeconomics*, Eighth Canadian Edition, by Lavinia Moldovan, Mount Royal University. Using your favourite polling solution, access a bank of questions created in PowerPoint for use with the eighth Canadian edition.

NETA Instructor's Manual

The Instructor's Manual to accompany Mankiw, *Principles of Microeconomics*, Eighth Canadian Edition, has been prepared by Phil Ghayad and Michel Mayer at Dawson College. This manual contains sample lesson plans, learning objectives, suggested classroom activities, and a resource integration guide to give instructors the support they need to engage their students within the classroom.

Instructor's Solutions Manual

This manual, prepared by the text authors, Ronald D. Kneebone and Kenneth J. McKenzie at the University of Calgary, has been independently checked for accuracy by Racquel Lindsay, University of Toronto. It contains complete solutions to the text's Quick Quizzes, Questions for Review, Quick Check Multiple Choice questions, and Problems.

Aplia + MindTap

MindTap is the digital platform that propels students from memorization to mastery, helping to challenge them, build their confidence, and empower them to be unstoppable. **Aplia™** is an application in the MindTap platform that has proven to significantly improve outcomes and elevate thinking by increasing student effort and engagement. Aplia makes it easy to assign frequent online homework assignments and assessments, ensuring students master important concepts. Developed by teachers, Aplia assignments connect concepts to the real world and focus on the unique course challenges faced by students. The MindTap content for *Principles of Microeconomics*, Eighth Canadian Edition, was updated and revised by Anupam Das, Mount Royal University. The Aplia problems for *Principles of Microeconomics*, Eighth Canadian Edition, were updated and revised by Marian Miles, University of Calgary.

The challenging and interactive activities within Aplia guide students through assignments, moving them from basic knowledge and understanding



to application and practice. Look for the Aplia logo in the MindTap app dock to explore all that Aplia has to offer. With Aplia, instructors can do the following:

- easily set their course with pre-built, flexible homework assignments;
- author questions (single choice, multiple choice, true/false, essay and numeric entry);
- create custom assignments and populate them with self-authored—and Aplia-authored—questions; and
- inspire students to learn from their mistakes and reward them for effort with the Grade It Now feature that enables three attempts at different versions of a question.

Student Ancillaries

Study Guide

Revised by Peter Fortuna, Algonquin College, and Troy Joseph, Carleton University, this Study Guide was prepared to enhance student success. Each chapter includes learning objectives, a description of the chapter’s context and purpose, a chapter review, key terms and definitions, advanced critical thinking questions, and helpful hints for understanding difficult concepts. Students can develop their understanding by doing practical problems and short-answer questions and then assess theory mastery of the key concepts with the self-test, which includes true/false and multiple choice questions prepared and edited under the NETA program for effective question construction. Solutions to all problems are included in the study guide (ISBN: 978-0-17-688809-1).

Aplia + MindTap

Stay organized and efficient with MindTap—a single destination with all your course materials and study tools you need to succeed. Leverage the latest learning technology to stay on track with your learning. For this generation of digital natives, guidance is key to student confidence and engagement. MindTap makes learning a more constant part of your life, motivating you to take a more active role in learning and course preparedness.



- Personalized content in an easy-to-use interface helps you achieve better grades.
- The new MindTap Mobile App allows for learning anytime, anywhere with flashcards, quizzes and notifications.
- The MindTap Reader lets you highlight and take notes online, right within the pages, and easily reference them later.
- ReadSpeaker will read the text to you.

Aplia guides you through assignments, moving from basic knowledge and understanding to application and practice. These challenging and interactive activities are designed to reinforce important concepts. With Aplia, you can do the following:

- learn from mistakes and reinforce your learning with Grade It Now, which provides three attempts at a question;
- get immediate step-by-step feedback; and
- gain understanding through real-world application of concepts.

ACKNOWLEDGMENTS

The success of each Canadian edition of *Principles of Macroeconomics* and *Principles of Microeconomics* 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.

Rauf Azhar, University of Guelph–Humber

Michael Barber, Queen’s University

Catherine Boulatoff, Dalhousie University

Cornelius Christian, Brock University

Samuel Gamtessa, University of Regina

Pierre-Pascal Gendron, Humber College Institute of Technology & Advanced Learning

David Gray, University of Ottawa

Troy Joseph, Carleton University

Ambrose Leung, Mount Royal University

Joy Liu, Vancouver Island University

Logan McLeod, Wilfrid Laurier University

Eric Moon, University of Toronto

Saeed Moshiri, St. Thomas Moore College, University of Saskatchewan

Don Reddick, Kwantlen Polytechnic University

Aqeela Tabassum, Humber College

Mike Tucker, Fanshawe College

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 Katherine Baker-Ross and Content Manager Sandy Matos for guiding us through the eighth Canadian edition.

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.