FIFTEENTH CANADIAN EDITION

RAGAN

ECONOMICS

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ECONOMICS

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McGILL UNIVERSITY

PEARSON
Toronto

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To the Instructor



Economics is a living discipline, changing and evolving in response to developments in the world economy and in response to the research of many thousands of economists throughout the world. Through fifteen editions, *Economics* has evolved with the discipline. Our purpose in this edition, as in the previous fourteen, is to provide students with an introduction to the major issues facing the world's economies, to the methods that economists use to study those issues, and to the policy problems that those issues create. Our treatment is everywhere guided by three important principles:

1. Economics is *scientific,* in the sense that it progresses through the systematic confrontation of theory by evidence. Neither theory nor data alone can tell us much about the world, but combined they tell us a great deal.

2. Economics is *useful,* and it should be seen by students to be so. An understanding of economic theory combined with knowledge about the economy produces many important insights about economic policy. Although we stress these insights, we are also careful to point out cases in which too little is known to support strong statements about public policy. Appreciating what is not known is as important as learning what is known.

3. We strive always to be *honest* with our readers. Although we know that economics is not always easy, we do not approve of glossing over difficult bits of analysis without letting readers see what is happening and what has been assumed. We take whatever space is needed to explain why economists draw their conclusions, rather than just asserting the conclusions. We also take pains to avoid simplifying matters so much that students would have to unlearn what they have been taught if they continue their study beyond the introductory course. In short, we have tried to follow Albert Einstein's advice:

   Everything should be made as simple as possible, but not simpler.

CURRENT ECONOMIC ISSUES

In writing the fifteenth edition of *Economics,* we have tried to reflect the major economic issues that we face in the early twenty-first century.

Living Standards and Economic Growth

One of the most fundamental economic issues is the determination of overall living standards. Adam Smith wondered why some countries become wealthy while others remain poor. Though we have learned much about this topic in the past 240 years since Adam Smith's landmark work, economists recognize that there is still much we do not know.

The importance of technological change in determining increases in overall living standards is a theme that permeates both the microeconomics and macroeconomics halves of this book. Chapter 8 explores how firms deal with technological change at the micro level, and how changes in their economic environment lead them to create new products and new production processes. Chapters 11 and 12 discuss how imperfectly competitive firms often compete through their innovative practices, and the importance for policymakers of designing competition policy to keep these practices as energetic as possible.

Technological change also plays a central role in our discussion of long-run economic growth in Chapter 25. We explore not only the traditional channels of saving, investment, and population growth, but also the more recent economic theories that emphasize the importance of increasing returns and endogenous growth.

We are convinced that no other introductory economics textbook places as much emphasis on technological change and economic growth as we do in this book. Given the importance of continuing growth in living standards and understanding where that growth comes from, we believe this emphasis is appropriate. We hope you agree.

Financial Crisis, Recession, and Recovery

The collapse of U.S. housing prices in 2007 led to a global financial crisis the likes of which had not been witnessed in a century, and perhaps longer. A

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deep recession, experienced in many countries, followed quickly on its heels. These dramatic events reawakened many people to two essential facts about economics. First, modern economies *can and do* go into recession. This essential fact had perhaps been forgotten by many who had become complacent after more than two decades of economic prosperity. Second, financial markets are crucial to the operation of modern economies. Like an electricity system, the details of financial markets are a mystery to most people, and the system itself is often ignored when it is functioning properly. But when financial markets cease to work smoothly and interest rates rise while credit flows decline, we are all reminded of their importance. In this sense, the financial crisis of 2007–2008 was like a global power failure for the world economy.

The financial crisis had micro causes and macro consequences. The challenges of appropriate regulation for financial and nonfinancial firms are explored in Chapters 12 and 16. The market for financial capital and the determination of interest rates are examined in Chapter 15. And debates regarding the appropriate role of the government in a market economy occur throughout the book, including in Chapters 1, 5, 16, 17, and 18.

On the macro side, the financial crisis affected the Canadian banking system, as discussed in Chapter 26, and led to some aggressive actions by the Bank of Canada, as discussed in Chapter 28. Moreover, as the global financial crisis led to a deep recession worldwide, Canadian fiscal policy was forced to respond, as we review in Chapters 24 and 31. Finally, as has happened several times throughout history, the recession raised the threat of protectionist policies, as we examine in Chapter 33.

Globalization

Enormous changes have occurred throughout the world over the last few decades. Flows of trade and investment between countries have risen so dramatically that it is now common to speak of the "globalization" of the world economy. Today it is no longer possible to study any economy without taking into account developments in the rest of the world.

Throughout its history, Canada has been a trading nation, and our policies relating to international trade have often been at the centre of political debates. International trade shows up in many parts of this textbook, but it is the exclusive focus of two chapters. Chapter 32 discusses the theory of the gains from trade; Chapter 33 explores trade policy, with an emphasis on NAFTA and the WTO.

With globalization and the international trade of goods and assets come fluctuations in exchange rates. In recent years there have been substantial changes in the Canada–U.S. exchange rate—a 15-percent depreciation followed the Asian economic crisis in 1997–1998 and also the 2014-2015 period, which saw a major decline in the world price of oil. An even greater appreciation occurred in the 2002–2008 period. Such volatility in exchange rates complicates the conduct of economic policy. In Chapters 27 and 28 we explore how the exchange rate fits into the design and operation of Canada's monetary policy. In Chapter 34 we examine the debate between fixed and flexible exchange rates.

The forces of globalization are with us to stay. In this fifteenth edition of *Economics,* we have done our best to ensure that students are made aware of the world outside Canada and how events elsewhere in the world affect the Canadian economy.

The Role of Government

Between 1980 and 2008, the political winds shifted in Canada, the United States, and many other countries. Political parties that previously advocated a greater role for government in the economy argued the benefits of limited government. But the political winds shifted again with the arrival of the financial crisis and global recession in 2008, which led governments the world over to take some unprecedented actions. Many soon argued that we were observing the "end of laissez-faire" and witnessing the return of "big government." But was that really true?

Has the *fundamental* role of government changed significantly over the past 35 years? In order to understand the role of government in the economy, students must understand the benefits of free markets as well as the situations that cause markets to fail. They must also understand that governments often intervene in the economy for reasons related more to equity than to efficiency.

In this fifteenth edition of *Economics,* we continue to incorporate the discussion of government policy as often as possible. Here are but a few of the many examples that we explore:

- tax incidence (in Chapter 4)
- the effects of minimum wages and rent controls (in Chapter 5)
- economic regulation and competition policy (in Chapter 12)

- pay equity policy (in Chapter 13)
- environmental policies (in Chapter 17)
- the disincentive effects of income taxes (in Chapter 18)
- fiscal policy (in Chapters 22 and 24)
- policies related to the economy's long-run growth rate (in Chapter 25)
- monetary policy (in Chapters 27, 28, and 29)
- policies that affect the economy's long-run unemployment rate (in Chapter 30)
- the importance of debt and deficits (in Chapter 31)
- trade policies (in Chapter 33)
- policies related to the exchange rate (in Chapter 34)

THE BOOK

Economic growth, financial crisis and recession, globalization, and the role of government are pressing issues of the day. Much of our study of economic principles and the Canadian economy has been shaped by these issues. In addition to specific coverage of growth and internationally oriented topics, growth and globalization appear naturally throughout the book in the treatment of many topics once thought to be entirely "domestic."

Most chapters of *Economics* contain some discussion of economic policy. We have two main goals in mind when we present these discussions:

1. We aim to give students practice in using economic theory, because applying theory is both a wonderfully effective teaching method and a reliable test of students' grasp of theory.
2. We want to introduce students to the major policy issues of the day and to let them discover that few policy debates are as "black and white" as they often appear in the press.

Both goals reflect our view that students should see economics as useful in helping us to understand and deal with the world around us.

The choice of whether to study macro first or micro first is partly a personal one that cannot be decided solely by objective criteria. We believe that there are excellent reasons for preferring the micro–macro order, and we have organized the book accordingly. For those who prefer the macro–micro order, we have attempted to make reversibility easy. The first three chapters provide a solid foundation whether you choose to first introduce microeconomics (Chapters 4–18) or macroeconomics (Chapters 19–34).

Microeconomics: Structure and Coverage

To open Part 1, Chapter 1 begins with an informal presentation of seven major issues of the day. We then introduce scarcity and choice, and this leads to a discussion of the market as a coordinating device. Finally, we turn to alternative economic systems. Comparisons with command economies help to establish what a market economy is *by showing what it is not*. Chapter 2 makes the important distinction between positive and normative inquiries and goes on to an introductory discussion of the construction and testing of economic theories.

Part 2 deals with demand and supply. After introducing price determination and elasticity in Chapters 3 and 4, we apply these tools in Chapter 5. The case studies are designed to provide practice in applying the tools rather than to give full coverage of each case presented. Chapter 5 also has an intuitive and thorough treatment of economic value and market efficiency.

Part 3 presents the foundations of demand and supply. The theory of consumer behaviour is developed via marginal utility theory in Chapter 6, which also provides an introduction to consumer surplus and an intuitive discussion of income and substitution effects. The Appendix to Chapter 6 covers indifference curves, budget lines, and the derivation of demand curves using indifference theory. Chapter 7 introduces the firm as an institution and develops short-run costs. Chapter 8 covers long-run costs and the principle of substitution and goes on to consider shifts in cost curves due to technological change. The latter topic is seldom if ever covered in the micro part of elementary textbooks, yet applied work on firms' responses to changing economic signals shows it to be extremely important.

The first two chapters of Part 4, Chapters 9 and 10, present the standard theories of perfect competition and monopoly with a thorough discussion of price discrimination and some treatment of international cartels. Chapter 11 deals with monopolistic competition and oligopoly, which are the market structures most commonly found in Canadian industries. Strategic behaviour plays a central part in the analysis of this chapter. The first half of Chapter 12 deals with the efficiency of competition and the inefficiency of monopoly. The last half of the chapter deals with regulation and competition policy.

Part 5 begins with Chapter 13, which discusses the general principles of factor pricing and how

factor prices are influenced by factor mobility. Chapter 14 then examines the operation of labour markets, addressing issues such as wage differentials, discrimination, labour unions, and the current trend of rising income inequality. Chapter 15 discusses investment in physical capital, the role of the interest rate, and the overall functioning of capital markets.

The first chapter of Part 6 (Chapter 16) provides a general discussion of market success and market failure and outlines the arguments for and against government intervention in a market economy. Chapter 17 deals with environmental regulation, with a detailed discussion of market-based policies and an introduction to the issue of global climate change. Chapter 18 analyzes taxes, public expenditure, and the main elements of Canadian social policy. These three chapters expand on the basics of microeconomic analysis by providing current illustrations of the relevance of economic theory to contemporary policy situations.

Macroeconomics: Structure and Coverage

Our treatment of macroeconomics is divided into six parts. We make a clear distinction between the economy in the short run and the economy in the long run, and we get quickly to the material on long-run economic growth. Students are confronted with issues of long-run economic growth *before* they are introduced to issues of money and banking. Given the importance of economic growth in driving overall living standards, we believe that this is an appropriate ordering of the material, but for those who prefer to discuss money before thinking about economic growth, the order can be easily switched without any loss of continuity.

The first macro chapter, Chapter 19, introduces readers to the central macro variables, what they mean, and why they are important. The discussion of national income accounting in Chapter 20 provides a thorough treatment of the distinction between real and nominal GDP, the GDP deflator, and a discussion of what measures of national income *do not measure* and whether these omissions really matter.

Part 8 develops the core short-run model of the macro economy, beginning with the fixed-price (Keynesian Cross) model in Chapters 21 and 22 and then moving on to the *AD/AS* model in Chapter 23. Chapter 21 uses a closed economy model with no government to explain the process of national-income determination and the nature of the multiplier. Chapter 22 extends the setting to include international trade and government spending and taxation. Chapter 23 rounds out our discussion of the short run with the *AD/AS* framework, discussing the importance of both aggregate demand and aggregate supply shocks. We place the Keynesian Cross before the *AD/AS* model to show that there is no mystery about where the *AD* curve comes from and why it is downward sloping; the *AD* curve is derived directly from the Keynesian Cross model. In contrast, books that begin their analysis with the *AD/AS* model are inevitably less clear about where the model comes from. We lament the growing tendency to omit the Keynesian Cross from introductory macroeconomics textbooks; we believe the model has much to offer students in terms of economic insights.

Part 9 begins in Chapter 24 by showing how the short-run model evolves toward the long run through the adjustment of factor prices—what we often call the Phillips curve. We introduce potential output as an "anchor" to which real GDP returns following *AD* or *AS* shocks. This chapter also addresses issues in fiscal policy, including the important distinction between automatic stabilizers and discretionary fiscal stabilization policy. Our treatment of long-run growth in Chapter 25, which we regard as one of the most important issues facing Canada and the world today, goes well beyond the treatment in most introductory texts.

Part 10 focuses on the role of money and financial systems. Chapter 26 discusses the nature of money, various components of the money supply, the commercial banking system, and the Bank of Canada. In Chapter 27 we offer a detailed discussion of the link between the money market and other economic variables such as interest rates, the exchange rate, national income, and the price level. In Chapter 28 we discuss the Bank of Canada's monetary policy, including a detailed discussion of inflation targeting. The chapter ends with a review of Canadian monetary policy over the past 30 years.

Part 11 deals with some of today's most pressing macroeconomic policy issues. It contains separate chapters on inflation, unemployment, and government budget deficits. Chapter 29 on inflation examines the central role of expectations in determining inflation and the importance of credibility on the part of the central bank. Chapter 30 on unemployment examines the determinants of frictional and structural unemployment and discusses likely reasons for increases in the NAIRU over the past few decades. Chapter 31 on budget deficits stresses the importance

of a country's debt-to-GDP ratio and also the effect of budget deficits on long-term economic growth.

Virtually every macroeconomic chapter contains at least some discussion of international issues. However, the final part of *Economics* focuses primarily on international economics. Chapter 32 gives the basic treatment of international trade, developing both the traditional theory of static comparative advantage and newer theories based on imperfect competition and dynamic comparative advantage. Chapter 33 discusses both the positive and normative aspects of trade policy, as well as the WTO and NAFTA. Chapter 34 introduces the balance of payments and examines exchange-rate determination. Here we also discuss three important policy issues: the desirability of current-account deficits or surpluses, whether there is a "right" value for the Canadian exchange rate, and the costs and benefits of Canada's adopting a fixed exchange rate.

We hope you find this menu both attractive and challenging; we hope students find the material stimulating and enlightening. Many of the messages of economics are complex—if economic understanding were only a matter of common sense and simple observation, there would be no need for professional economists and no need for textbooks like this one. To understand economics, one must work hard. Working at this book should help readers gain a better understanding of the world around them and of the policy problems faced by all levels of government. Furthermore, in today's globalized world, the return to education is large. We like to think that we have contributed in some small part to the understanding that increased investment in human capital by the next generation is necessary to restore incomes to the rapid growth paths that so benefited our parents and our peers. Perhaps we may even contribute to some income-enhancing accumulation of human capital by some of our readers.

SUBSTANTIVE CHANGES TO THIS EDITION

We have revised and updated the entire text with guidance from both users and nonusers of the previous editions of this book. For this edition, we have aimed to reduce the book's length by about 10 percent, and this required streamlining many discussions and deleting some boxes. As always, we have strived very hard to improve the teachability and readability of the book. We have focused the discussions so that each major point is emphasized as clearly as possible, without distracting the reader with nonessential points. As in recent editions, we have kept all core material in the main part of the text. Three types of boxes (Applying Economic Concepts, Lessons from History, and Extensions in Theory) are used to show examples or extensions that can be skipped without fear of missing an essential concept. But we think it would be a shame to skip too many of them, as there are many interesting examples and policy discussions in these boxes.

What follows is a brief listing of the main changes that we have made to the textbook.

Microeconomics

Part 1: What is Economics?

In Chapter 1 we have added income inequality to the initial list of motivating topics, deleted the box on the failure of central planning, and have deleted the appendix on graphing (given that this topic is well covered in Chapter 2).

Part 2: An Introduction to Demand and Supply

In Chapter 3 on demand and supply, we have provided a fuller discussion of weather shocks, and have added a numerical example of a demand-and-supply model. We have deleted the box on weather events as well as the box on the algebra of market equilibrium. In Chapter 4 on elasticity, we have clarified the discussion by adding summary tables for each type of elasticity and have deleted the box on the algebra of tax incidence. We have also clarified the distinction between normal and inferior goods and provided numerical examples to demonstrate this distinction. Lastly, we have added a new small box on economic development and income elasticities. In Chapter 5 we have deleted the former opening section on the interaction of markets.

Part 3: Consumers and Producers

In Chapter 7 on the theory of the firm, we have streamlined the discussion of diminishing marginal returns, deleted the box on idle capital equipment and flat cost curves, and have added a new box on the flat marginal cost curves (and high fixed costs) characteristic of many digital products. In Chapter 8 on firms in the long run, we have added the example of Ford's River Rouge factory to illustrate diseconomies of scale. Also in Chapter 8, we have streamlined the discussion of the three aspects of technological change, and deleted the box on the evolution of personal banking.

Part 4: Market Structure and Efficiency

We have streamlined several small parts of Chapter 9, and have deleted the discussion of sunk costs and a firm's exit from the industry. In Chapter 10 we added a new discussion of why monopolies are rare, which now feeds into the discussion on entry barriers. We removed the box on Irish pubs, added modern examples to the existing box on creative destruction, and streamlined the discussion of cartels. In Chapter 11 on imperfect competition, we have rewritten the entire first section, streamlined the section on oligopoly in practice, and deleted the box about OPEC. In Chapter 12 we have shortened the discussion of market structure and efficiency, deleted the box on allocative efficiency and income distribution, and also deleted the box on innovation and imperfect competition.

Part 5: Factor Markets

In Chapter 13, the short section on income distribution, together with the box on income inequality, have been moved to Chapter 14 where we now have an expanded discussion of the ongoing trend in Canada and elsewhere toward greater income inequality. In Chapter 14 on labour markets, we have re-worked the introduction, which now motivates the chapter's topics with the figure on the changing shares of Canadian employment over the past century. We have streamlined the discussions of wage differentials and bilateral monopoly. In Chapter 14 we have also deleted the box on the development of labour unions as well as the old final section on the "good jobs/bad jobs" debate. The chapter now ends with a new section on rising income inequality, with current data, various possible explanations, and some policy discussion.

Part 6: Government in the Market Economy

In Chapter 16 we have clarified our discussions of common-property resources, moral hazard, and the preferences for public provision. We have removed the brief discussion of economic growth from the "broader social goals" discussion, and have streamlined the discussion of government intervention and failure. In Chapter 17 on environmental policy we have removed the discussion of uncertainty and the choice between emissions taxes and "cap and trade" systems and have added a new box providing examples of pollution pricing. The old section on past (and mostly ineffective) Canadian climate policy has been deleted, as has the box on the open letter from economists. We have added a new section on current Canadian climate policy, which focuses on provincial policies currently in place.

Macroeconomics

Part 7: An Introduction to Macroeconomics

At the beginning of Chapter 19 we have removed the discussion of the two approaches to macroeconomics and moved that material into the Instructor's Manual. In Chapter 20 we have removed the discussion of GNP, focussing only on GDP, its measurement, meaning, and omissions.

Part 8: The Economy in the Short Run

There are no major changes in Chapters 21 and 22. These two chapters still lay out the basic demand-determined macro model—first in a closed economy with no government and then in the expanded and more realistic version (with government and foreign trade). In Chapter 23 we have deleted the box on the Keynesian AS curve, but have incorporated some of this material into the body of the text.

Part 9: The Economy in the Long Run

In Chapter 24 we have re-designed the opening section of the chapter, which explains the three macroeconomic states, and have shortened our discussion toward the end of the chapter regarding the effects of fiscal policy on potential output. We have deleted the former Chapter 25, but moved the box on real-world examples of productivity growth to the newly renumbered Chapter 25, which examines long-run growth.

Part 10: Money, Banking, and Monetary Policy

The two opening chapters on money and banking and the money market are still largely unchanged. In Chapter 28, which examines Canadian monetary policy in considerable detail, we have extended the final section to discuss the slow economic recovery since 2011, and the challenges faced by the Bank's new governor.

Part 11: Macroeconomic Problems and Policies

In Chapter 29 on inflation, we have removed the box on expectations formation, but say more about it in the main part of the text. We have also deleted the box on the NAIRU as a razor's edge. In Chapter 30, we have clarified the discussion about the two competing sets of theories regarding fluctuations in unemployment. In Chapter 31 on deficits and debt, we have clarified the discussion of the primary budget deficit, and now use numerical examples to demonstrate the concept. We have also entirely reworked our discussion of structural and cyclical budget deficits, and how these relate to the stance of fiscal policy.

Part 12: Canada in the Global Economy

In Chapter 32 on the gains from trade, we have clarified our discussion of scale economies and intra-industry trade. In Chapter 33 we have vastly streamlined the discussion of the WTO (and GATT) and we have deleted the box on the transformation of Canadian trade. In Chapter 34 we have clarified the connection between the official financing account and the central bank's intervention in the foreign-exchange market. We have also shortened the algebraic derivation of the current account, and moved this material into a footnote. We have updated the discussion of the shock-absorbing properties of the exchange rate using the most recent decline in the world price of oil as an example.

* * *

If you are moved to write to us (and we hope that you will be!), please do. You can send any comments or questions regarding the text (or any of the supplementary material, such as the *Instructor's Manual*, the *TestGen*, or the web-based MyEconLab to:

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To the Student



Welcome to what is most likely your first book about economics! You are about to encounter what is for most people a new way of thinking, which often causes people to see things differently than they did before. But learning a new way of thinking is not always easy, and you should expect some hard work ahead. We do our best to be as clear and logical as possible and to illustrate our arguments whenever possible with current and interesting examples.

You must develop your own technique for studying, but the following suggestions may prove helpful. Begin by carefully considering the Learning Objectives at the beginning of a chapter. Read the chapter itself relatively quickly in order to get the general idea of the argument. At this first reading, you may want to skip the boxes and any footnotes. Then, after reading the Summary and the Key Concepts (at the end of each chapter), reread the chapter more slowly, making sure that you understand each step of the argument.

With respect to the figures and tables, be sure you understand how the conclusions that are stated in boldface at the beginning of each caption have been reached. You should be prepared to spend time on difficult sections; occasionally, you may spend an hour on only a few pages. Paper and pencil are indispensable equipment in your reading. It is best to follow a difficult argument by building your own diagram while the argument unfolds rather than by relying on the finished diagram as it appears in the book.

The end-of-chapter Study Exercises require you to practise using some of the concepts that you learned in the chapter. These will be excellent preparation for your exams. To provide you with immediate feedback, we have posted Solutions to Selected Study Exercises on MyEconLab (www.myeconlab.com). We strongly advise that you should seek to understand economics, not to memorize it.

The red numbers in square brackets in the text refer to a series of mathematical notes that are found starting on page M-1 at the end of the book. For those of you who like mathematics or prefer mathematical argument to verbal or geometric exposition, these may prove useful. Others may disregard them.

In this edition of the book, we have incorporated many elements to help you review material and prepare for examinations. A brief description of all the features in this book is given in the separate section that follows.

We encourage you to make use of MyEconLab that accompanies this book (www.myeconlab.com) at the outset of your studies. MyEconLab contains a wealth of valuable resources to help you. MyEconLab provides Solutions to Selected Study Exercises. It also includes many additional practice questions, some of which are modelled on Study Exercises in the book. You can also find animations of some of the key figures in the text, marked with the symbol below the figure number, as well as an electronic version of the textbook. For more details about MyEconLab, please see the description on the inside front cover of your text.

Over the years, the book has benefited greatly from comments and suggestions we have received from students. Please feel free to send your comments to christopher.ragan@mcgill.ca. Good luck, and we hope you enjoy your course in economics!

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Features of This Edition



We have made a careful effort with this edition to incorporate features that will facilitate the teaching and learning of economics.

- A set of **Learning Objectives** at the beginning of each chapter, correlated to the **Chapter Outline,** clarifies the skills and knowledge to be learned in each chapter. These same learning objectives are used in the chapter summaries, as well as in the *Study Guide*.


PART 2: AN INTRODUCTION TO DEMAND AND SUPPLY

3 Demand, Supply, and Price

CHAPTER OUTLINE

3.1 DEMAND

3.2 SUPPLY

LEARNING OBJECTIVES (LO)

After studying this chapter, you will be able to

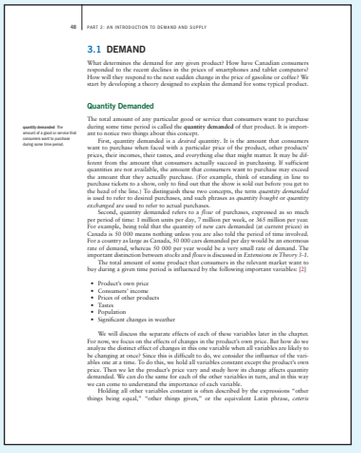
1 list the factors that determine the quantity demanded of a good.

2 distinguish between a shift of the demand curve and a movement along the demand curve.

3 list the factors that determine the quantity supplied of a good.

4 distinguish between a shift of the supply curve and a move-

- **Major ideas** are highlighted with a yellow background in the text.
- **Key terms** are boldfaced where they are defined in the body of the text, and they are restated with their definitions in the margins. In the index at the back of the book, each key term and the page reference to its definition are boldfaced.


48 PART 2: AN INTRODUCTION TO DEMAND AND SUPPLY

3.1 DEMAND

What determines the demand for any given product? How have Canadian consumers responded to the recent declines in the prices of smartphones and tablet computers? How will they respond to the next sudden change in the price of gasoline or coffee? We start by developing a theory designed to explain the demand for some typical product.

Quantity Demanded

quantity demanded The amount of a good or service that consumers want to purchase during some time period.

The total amount of any particular good or service that consumers want to purchase during some time period is called the **quantity demanded** of that product. It is important to notice two things about this concept.

First, quantity demanded is a desired quantity. It is the amount that consumers want to purchase when faced with a particular price of the product, other products' prices, their incomes, their tastes, and everything else that might matter. It may be different from the amount that consumers actually succeed in purchasing. If sufficient quantities are not available, the amount that consumers want to purchase may exceed the amount that they actually purchase. (For example, think of standing in line to purchase tickets to a show, only to find out that the show is sold out before you get to the head of the line.) To distinguish these two concepts, the term *quantity demanded* is used to refer to desired purchases, and such phrases as *quantity bought* or quantity *exchanged* are used to refer to actual purchases.

Second, quantity demanded refers to a *flow* of purchases, expressed as so much per period of time: 1 million units per day, 7 million per week, or 365 million per year. For example, being told that the quantity of new cars demanded (at current prices) in Canada is 50 000 means nothing unless you are also told the period of time involved. For a country as large as Canada, 50 000 cars demanded per day would be an enormous rate of demand, whereas 50 000 per year would be a very small rate of demand. The important distinction between *stocks* and *flows* is discussed in *Extension in Theory 3-1*.

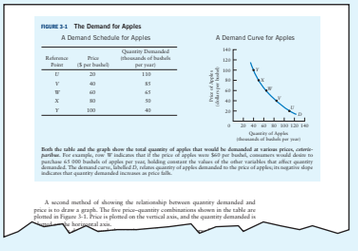
The total amount of some product that consumers in the relevant market want to buy during a given time period is influenced by the following important variables: [2]

- Product's own price
- Consumers' income
- Prices of other products
- Tastes
- Population
- Significant changes in weather

We will discuss the separate effects of each of these variables later in the chapter. For now, we focus on the effects of changes in the product's own price. But how do we analyze the distinct effect of changes in this one variable when all variables are likely to be changing at once? Since this is difficult to do, we consider the influence of the variables one at a time. To do this, we hold all variables constant except the product's own price. Then we let the product's price vary and study how its change affects quantity demanded. We can do the same for each of the other variables in turn, and in this way we can come to understand the importance of each variable.

Holding all other variables constant is often described by the expressions "other things being equal," "other things given," or the equivalent Latin phrase, *ceteris*

- The **colour scheme for figures** consistently uses the same colour for each type of curve. For example, all demand curves are blue and all supply curves are red.
- **A caption for each figure and table** summarizes the underlying economic reasoning. Each caption begins with a boldfaced statement of the relevant economic conclusion.


FIGURE 3-1 The Demand for Apples

A Demand Schedule for Apples

Reference Point	Price ($ per bushel)	Quantity Demanded (thousands of bushels per year)
U	20	110
V	40	85
W	60	65
X	80	50
Y	100	40

A Demand Curve for Apples

Price of Apples ($ per bushel)

Quantity of Apples (thousands of bushels per year)

Both the table and the graph show the total quantity of apples that would be demanded at various prices, *ceteris paribus*. For example, if the price of apples were $60 per bushel, consumers would desire to purchase 65 000 bushels of apples per year, holding constant the values of the other variables that affect quantity demanded. The demand curve, labelled *D*, relates quantity of apples demanded to the price of apples; its negative slope indicates that quantity demanded increases as price falls.

A second method of showing the relationship between quantity demanded and price is to draw a graph. The five price–quantity combinations shown in the table are plotted in Figure 3-1. Price is plotted on the vertical axis, and the quantity demanded is plotted on the horizontal axis.

- **Applying Economic Concepts** boxes demonstrate economics in action, providing examples of how theoretical material relates to issues of current interest.
- **Extensions in Theory** boxes provide a deeper treatment of a theoretical topic that is discussed in the text.
- **Lessons from History** boxes contain discussions of a particular policy debate or empirical finding that takes place in a historical context.
- **Photographs with short captions** are interspersed throughout the chapters to illustrate some of the arguments.


APPLYING ECONOMIC CONCEPTS 3-1

Why Apples but Not iPhones?

The demand-and-supply model that we have developed in this chapter does not apply to the markets for all goods and services, and there is a good reason why our example throughout the chapter has been apples and not, for example, iPhones, cars, brand-name clothing, or even textbooks. Three conditions must be satisfied in order for a market for a product to be said to be well described by the demand-and-supply model.

1. There must be a large number of consumers of the product, each one small relative to the size of the market.
2. There must be a large number of producers of the product, each one small relative to the size of the market.
3. Producers must be selling identical or "homogeneous" versions of the product.

The first assumption ensures that no single consumer is large enough to influence the market price through their buying actions. This is satisfied in most markets, although there are important exceptions. For example, federal or provincial governments are dominant purchasers of prescription drugs in Canada, and they use their power to try to keep prices below what they would otherwise be.

The second assumption ensures that no single producer is large enough to influence the market price through their selling actions. There are many markets in which this is not true. For example, DeBeers controls the sale of a large fraction of the world's rough diamonds, and thus it can alter the market price through its sales restrictions. Hydro Québec is the sole producer of electricity in the province of Québec and sets the price that consumers pay. In contrast, most producers of fruits and vegetables are very small relative to the size of the market and have no ability to influence the market price.

The third assumption ensures that there will be a single price in the market. Producers would have the ability to differentiate their product from those of other producers. This condition is satisfied in many markets for commodities—steel, aluminum, copper, wheat, oil, natural gas, lumber, newsprint, beef, pork, etc. But it is not satisfied in the markets for many consumer products such as smartphones and other electronic devices, cars and motorcycles, clothing, and fast food and other restaurant meals. In these cases, each producer sells a slightly different product and uses advertising and other advertising measures trying to convince consumers to purchase their version. In these markets, differentiated products sell at different prices.

When all three conditions are satisfied, economists use the demand-and-supply model to explain the determination of market price and quantity. This model has proven to be very successful in explaining outcomes in markets such as oil, steel, copper, wheat, soybeans, beef, pork, newsprint, and lumber, foreign currencies, financial assets, stocks, and bonds, to name a few.

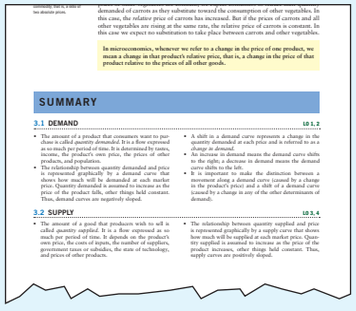
We have found when you are to apply the demand-and-supply model. It works very well in describing the events in many markets, but not so well for others. Later chapters in this book will examine the more complex markets for which we need a more advanced model.

the stock of unsold apples, will begin to offer less money for the product. In other words, *excess supply causes downward pressure on price*.

Now consider the price of $20 per bushel. At this price, there is excess demand. The 20 000 bushels produced each year are snapped up quickly, and 90 000 bushels of desired purchases cannot be made. Rivalry between would-be purchasers may lead them to offer more than the prevailing price to outbid other purchasers. Also, sellers may begin to ask a higher price for the quantities that they do have to sell. In other words, *excess demand causes upward pressure on price*.

Finally, consider the price of $40. At this price, producers want to sell 65 000 bushels per year, and purchasers want to buy that same quantity. There is neither

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In microeconomics, whenever we refer to a change in the price of one product, we mean a change in that product's relative price, that is, a change in the price of that product relative to the prices of all other goods.

SUMMARY

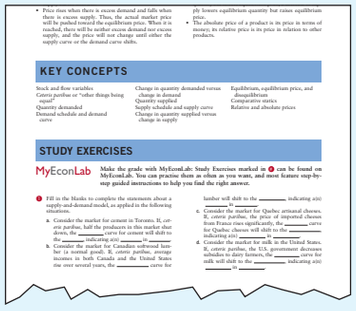
3.1 DEMAND LO 1, 2

- The amount of a product that consumers want to purchase is called *quantity demanded*. It is a flow expressed as so much per period of time. It is determined by tastes, the product's own price, the prices of other products, and population.
- The relationship between quantity demanded and price is represented graphically by a demand curve that shows how much will be demanded at each market price. Quantity demanded is assumed to increase as the price of the product falls, other things held constant. Thus, demand curves are negatively sloped.
- A shift in a demand curve represents a change in the quantity demanded at each price and is referred to as a *change in demand*.
- An increase in demand means the demand curve shifts to the right; a decrease in demand means the demand curve shifts to the left.
- It is important to make the distinction between a movement along a demand curve (caused by a change in the product's price) and a shift of a demand curve (caused by a change in any of the other determinants of demand).

3.2 SUPPLY LO 3, 4

- The amount of a good that producers wish to sell is called *quantity supplied*. It is a flow expressed as so much per period of time. It depends on the product's own price, the costs of inputs, the number of suppliers, government taxes or subsidies, the state of technology, and prices of other products.
- The relationship between quantity supplied and price is represented graphically by a supply curve that shows how much will be supplied at each market price. Quantity supplied is assumed to increase as the price of the product increases, other things held constant. Thus, supply curves are positively sloped.

- **Chapter Summaries** are organized using the same numbered heading as found in the body of the chapter. The relevant Learning Objective (LO) numbers are given in red next to each heading in the summary.



- Price rises when there is excess demand and falls when there is excess supply. Thus, the actual market price will be pushed toward the equilibrium price. When it is reached, there will be neither excess demand nor excess supply, and the price will not change until either the supply curve or the demand curve shifts.
- Only lower equilibrium quantity but raises equilibrium price.
- The absolute price of a product is its price in terms of money; its relative price is its price in relation to other products.

KEY CONCEPTS

Stock and flow variables
Ceteris paribus or "other things being equal"
Quantity demanded
Demand schedule and demand curve
Change in quantity demanded versus change in demand
Quantity supplied
Supply schedule and supply curve
Change in quantity supplied versus change in supply
Equilibrium, equilibrium price, and disequilibrium
Comparative statics
Relative and absolute prices

STUDY EXERCISES

MyEconLab **Make the grade with MyEconLab: Study Exercises marked in ● can be found on MyEconLab. You can practice them as often as you want, and most feature step-by-step guided instructions to help you find the right answer.**

● Fill in the blanks to complete the statements about a supply-and-demand model, as applied in the following situations.

a. Consider the market for cement in Toronto. If, *ceteris paribus*, half the producers in this market shut down, the _____ curve for cement will shift to the _____ indicating a(n) _____ in _____

b. Consider the market for Canadian softwood lumber (a normal good). If, *ceteris paribus*, average incomes in both Canada and the United States rise over several years, the _____ curve for lumber will shift to the _____ indicating a(n) _____ in _____

6. Consider the market for Quebec artisanal cheeses. If, *ceteris paribus*, the price of imported cheeses from France rises significantly, the _____ curve for Quebec cheeses will shift to the _____ indicating a(n) _____ in _____

4. Consider the market for milk in the United States. If, *ceteris paribus*, the U.S. government decreases the subsidy to farmers, the _____ curve for milk will shift to the _____ indicating a(n) _____ in _____

- **Key Concepts** are listed near the end of each chapter.
- A set of **Study Exercises** is provided for each chapter. These often quantitative exercises require the student to analyze problems by means of computations, graphs, or explanations.



Mathematical Notes

1. Because one cannot divide by zero, the ratio $\Delta Y/\Delta X$ cannot be evaluated when $\Delta X = 0$. However, as ΔX *approaches* zero, the ratio $\Delta Y/\Delta X$ increases without limit:

$$\lim_{\Delta X \to 0} \frac{\Delta Y}{\Delta X} = \infty$$

Therefore, we say that the slope of a vertical line (when $\Delta X = 0$ for any ΔY) is equal to infinity.

2. Many variables affect the quantity demanded. Using functional notation, the argument of the next several pages of the text can be anticipated. Let Q^D represent the quantity of a commodity demanded and

$$T, \overline{T}, N, \bar{Y}, p, p_i$$

represent, respectively, tastes, average household income, population, income distribution, the commodity's own price, and the price of the ith other commodity.

The demand function is

$$Q^D = D(T, \overline{T}, N, \bar{Y}, p, p_i), \quad i = 1, 2, \ldots, m$$

The demand schedule or curve is given by

$$Q^D = d(p)\Big|_{\bar{x}, \overline{T}, N, \bar{Y}, \bar{p}^m}$$

where the notation means that the variables to the right of the vertical line are held constant.

This function is correctly described as the demand function with respect to price, all other variables being held constant. This function, often written concisely as $Q^D = d(p)$, shifts in response to changes in other variables. Consider average income: if, as is usually hypothesized, $\partial Q^D/\partial \bar{Y} > 0$, then increases in average income shift $Q^D = d(p)$ rightward and decreases in average income shift $Q^D = d(p)$ leftward. Changes in other variables likewise shift this function in the direction implied by the relationship of that variable to the quantity demanded.

3. Quantity demanded is a simple and straightforward but frequently misunderstood concept in everyday use, but it has a clear mathematical meaning. It refers to the dependent variable in the demand function from note 2:

$$Q^D = D(T, \overline{T}, N, \bar{Y}, p, p_i)$$

It takes on a specific value whenever a specific value is assigned to each of the independent variables. The value of Q^D changes whenever the value of any independent variable is changed. Q^D could change, for example, as a result of a change in any one price, in average income, in the distribution of income, in tastes, or in population. It could also change as a result of the net effect of changes in all of the independent variables occurring at once.

Some textbooks reserve the term *change in quantity demanded* for a movement along a demand curve, that is, a change in Q^D as a result only of a change in p. They then use other words for a change in Q^D caused by a change in the other variables in the demand function. This usage is potentially confusing because it gives the single variable Q^D more than one name.

Our usage, which corresponds to that in more advanced treatments, avoids this confusion. We call Q^D *quantity demanded* and refer to any change in Q^D as a *change in quantity demanded*. In this usage it is correct to say that a movement along a demand curve is a change in quantity demanded, but it is incorrect to say that a change in quantity demanded can occur *only because of* a movement along a demand curve (because Q^D can change for other reasons, for example, a *ceteris paribus* change in average household income).

4. Similar to the way we treated quantity demanded in note 2, let Q^S represent the quantity of a commodity supplied and

$$C, \bar{X}, p, w_i$$

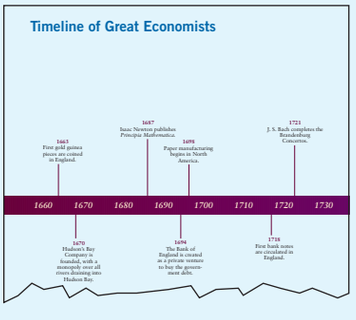
represent, respectively, producers' goals, technology, the product's price, and the price of the ith input.

The supply function is

$$Q^S = S(C, \bar{X}, p, w_i), \quad i = 1, 2, \ldots, m$$

M-1

- A set of **Mathematical Notes** is presented in a separate section near the end of the book. Because mathematical notation and derivations are not necessary to understand the principles of economics but are more helpful in advanced work, this seems to be a sensible arrangement. References in the text to these mathematical notes are given by means of red numbers in square brackets.



- A **Timeline of Great Economists,** extending from the mid-seventeenth century to the late twentieth century, is presented near the end of the book. Along this timeline we have placed brief descriptions of the life and works of some great economists, most of whom the reader will encounter in the textbook. The timeline also includes some major world events in order to give readers an appreciation of when these economists did their work.
- **Economists on Record,** on the inside of the back cover, provides some classic quotations that are relevant to the study and practice of economics.
- For convenience, a list of the **Common Abbreviations Used in the Text** is given inside the front cover.

Supplements



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- The Gradebook records each student's performance and time spent on the Tests and Study Plan and generates reports by student or by chapter.
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Acknowledgements

It would be impossible to acknowledge here by name all the teachers, colleagues, and students who contributed to the development and improvement of this book over its previous fourteen editions. Hundreds of users have written to us with specific suggestions, and much of the credit for the improvement of the book over the years belongs to them. We can no longer list them individually but we thank them all sincerely.

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- Kevin Richter, Douglas College
- Fulton Tom, Langara College
- Mayssun El-Attar Vilalta, McGill University

We would like to express our thanks to the many people at Pearson Canada involved in the development and production of this textbook. We would especially like to thank three individuals with whom we worked closely. Megan Farrell (Acquisitions Editor); Keriann McGoogan (Senior Developmental Editor); Loula March (Marketing Manager) all showed their professionalism, dedication, and enthusiasm in guiding this book through the publication and marketing processes. We would also like to thank the many sales representatives who work to bring this book to professors across the country. These individuals have been a pleasure to work with each step along the way, and we are deeply grateful for their presence and their participation and delighted to consider them friends as well as professional colleagues.

Our thanks also to the many people at Pearson with whom we work less closely but who nonetheless toil behind the scenes to produce this book, including Andrea Falkenberg, Vastavikta Sharma and Anthony Leung.

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In short, we realize that there is a great deal more involved in producing a book than *just* the writing. Without the efforts of all of these dedicated professionals, this textbook simply would not exist. Our sincere thanks to all of you.

Thanks also to Simon Altman for his detailed and diligent work in assembling the necessary data for updating this fifteenth edition.

Finally, Ingrid Kristjanson is deeply involved in each revision of this textbook. Without her participation, the quality and efficiency of this project would suffer greatly. In addition, for the past four editions she has played a leading role in the improvement, rewriting, and expansion of the electronic Testbank. With her involvement, the lengthy revision of the textbook and its supplements continues to be an enriching and pleasant experience.

Christopher Ragan

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About the Author



Chris Ragan received his B.A. in economics from the University of Victoria, his M.A. from Queen's University, and his Ph.D. from the Massachusetts Institute of Technology in Cambridge, Massachusetts in 1990. He then joined the Department of Economics at McGill University in Montreal, where he has taught graduate courses in macroeconomics and international finance and undergraduate courses in macroeconomic theory and policy, current economic issues, and financial crises. Over the years he has taught principles of economics (micro and macro) to thousands of students at McGill and maintains a reputation on campus as being "super-excited" about economics. In 2007, Chris Ragan was awarded the Noel Fieldhouse Teaching Award from McGill for teaching excellence.

Professor Ragan's research focuses mainly on the design and implementation of macroeconomic policy in Canada. He has been privileged to serve the federal government in Ottawa as Special Advisor to the Governor of the Bank of Canada and as the Clifford Clark Visiting Economist at the Department of Finance. He currently serves as the chair of Canada's Ecofiscal Commission, a five-year project of independent economists and advisors to promote the greater use of pollution pricing in the Canadian economy.

Chris Ragan used the third edition of this textbook as an undergraduate student in 1981 and joined Richard Lipsey as a co-author in 1997 for the book's ninth edition. For several editions, Lipsey and Ragan worked diligently to maintain the book's reputation as the clearest and most comprehensive introductory economics textbook in Canada. Although Professor Ragan is now the sole listed author, this fifteenth edition of *Economics* still owes much to the dedication of previous authors, including Richard Lipsey, Douglas Purvis, and Gordon Sparks.

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