

Seventh Canadian Edition

Macroeconomics

Abel | Bernanke | Croushore | Kneebone

Macroeconomics

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Symbols Used in This Book

A	productivity	V	velocity
B	government debt	W	nominal wage
$BASE$	monetary base	Y	total income or output
C	consumption	\bar{Y}	full-employment output
CA	current account balance	a	individual wealth or assets
CU	currency in circulation	c	individual consumption; consumption per worker
DEP	bank deposits	cu	currency–deposit ratio
E	worker effort	d	depreciation rate
G	government purchases	e	real exchange rate
I	investment	e_{nom}	nominal exchange rate
INT	net interest payments	g	growth rate of GDP
K	capital stock	\bar{e}_{nom}	official value of nominal exchange rate
KA	capital account balance	i	nominal interest rate
M	money supply	i^m	nominal interest rate on money
MC	marginal cost	k	capital–labour ratio
MPK	marginal product of capital	n	growth rate of labour force
MPN	marginal product of labour	p_K	price of capital goods
$MRPN$	marginal revenue product of labour	r	expected real interest rate
N	employment, labour	r^w	world real interest rate
\bar{N}	full-employment level of employment	r_{a-t}	expected after-tax real interest rate
NFP	net factor payments	res	reserve–deposit ratio
NM	nonmonetary assets	s	individual saving; saving rate
NX	net exports	t	income tax rate
P	price level	u	unemployment rate
P^e	expected price level	\bar{u}	natural unemployment rate
$PVLC$	present value of lifetime consumption	uc	user cost of capital
$PVLR$	present value of lifetime resources	w	real wage
R	real seignorage revenue	y	individual labour income; output per worker
RES	bank reserves	π	inflation rate
S	national saving	π^e	expected inflation rate
S_{pvt}	private saving	η_Y	income elasticity of money demand
S_{govt}	government saving	τ	effective tax rate
T	taxes		
TR	transfers		

PREFACE

In the seventh Canadian edition of *Macroeconomics*, we have added—and subtracted—material to keep the text focused and up to date while building on the strengths that underlie the book’s lasting appeal, including:

- ***Real-world applications.*** A perennial challenge for instructors is to help students make active use of the economic ideas developed in the text. The rich variety of applications in this book shows by example how economic concepts can be put to work in explaining real-world issues, such as increasing wage inequality, the productivity slowdown, sources of international financial crises, and alternative approaches to making monetary policy. *The seventh Canadian edition has updated the best applications of previous editions but has also removed applications that are less relevant and of less interest to current students.*
- ***Broad modern coverage.*** From its conception, *Macroeconomics* has responded to students’ desires to investigate and understand a wider range of macroeconomic issues than permitted by the course’s traditional emphasis on short-run fluctuations and stabilization policy. This book provides a modern treatment of these traditional topics but also gives in-depth coverage of other important macro issues, such as the determinants of long-run economic growth, international trade and capital flows, labour markets, and the political and institutional framework of policymaking. This comprehensive coverage also makes the book a useful tool for instructors with differing views about course coverage and topic sequence.
- ***Reliance on a set of core economic ideas.*** Although we cover a wide range of topics, we avoid developing a new model or theory for each issue. Instead, we emphasize the broad applicability of a set of core economic ideas (such as the production function, the trade-off between consuming today and saving for tomorrow, and supply–demand analysis). Using these core ideas, we build a theoretical framework that encompasses all the macroeconomic analyses presented in the book: long run and short run, open economy and closed economy, and classical and Keynesian.
- ***A balanced presentation.*** Macroeconomics is full of controversies, many of which arise from the split between classicals and Keynesians (of the old, new, and neo- varieties). Sometimes, the controversies overshadow the broad common ground shared by the two schools. We emphasize that common ground. First, we pay greater attention to long-run issues (on which classicals and Keynesians have less disagreement). Second, we develop the classical and Keynesian analyses of short-run fluctuations within a single overall framework, in which we show that the two approaches differ principally in their assumptions about how quickly wages and prices adjust. Where differences in viewpoint remain—for example, in the search versus efficiency-wage interpretations of unemployment—we present and critique both perspectives. This balanced approach exposes students to all the best ideas in modern macroeconomics. At the same time, an instructor of either classical or Keynesian inclinations can easily base a course on this book.

- ***Innovative pedagogy.*** The seventh Canadian edition, like its predecessors, provides useful tools to help students study, understand, and retain the material. Described in more detail later in the Preface, these tools include Summary tables, Key Diagrams, Key Terms, and Key Equations to aid students in organizing their study, and three types of problems for practice and developing understanding.

NEW AND UPDATED COVERAGE

What is taught in intermediate economics courses—and how it is taught—has changed substantially in recent years. Previous editions of *Macroeconomics* played a major role in these developments. The seventh Canadian edition tightens its focus on the critical issues of macroeconomics and has introduced changes that cause it to better fit how instructors teach intermediate macroeconomics. Key pedagogical changes with this edition include:

- ***The Aggregate Supply Relationship.*** Past editions introduced a horizontal aggregate supply (*AS*) relationship in order to deal with the assumption of fixed prices. Unfortunately, this came at the price of confusing students faced with horizontal, sloped and, finally, vertical aggregate supply curves at various places in the text. It also challenged students to grasp the fundamentals of the *AD–AS* model even before they had completely learned the *IS–LM–FE* model. In the seventh edition we have removed the horizontal *AS* curve and replaced it with a simple description of the fixed-price assumption and the desirability of making that assumption in the early part of the text. The *AS* relationship and the *AD–AS* model are now left for later in the text, where they can be fully explored and only after students have had the opportunity to fully investigate and appreciate the *IS–LM–FE* model.
- ***Expectations.*** New with this edition is a clear statement of when we introduce into the macroeconomic model the important role played by the expectations formed by households and firms. This clear statement makes it possible for us to delay the introduction of the aggregate supply curve until Chapter 11 when the issue of endogenous expectations formation is first introduced into the macroeconomic model. This presentation has the important advantage of enabling instructors to clearly separate their presentations of the model of the business cycle into two versions: one where expectations are exogenously determined and, later, one where price expectations are endogenously determined. This step-by-step process of adding complications to the model only after the basics have been mastered significantly improves the pedagogy of the text.
- ***Algebraic Presentation.*** The appendix to Chapter 12 has been completely revised and now shows students how to calculate comparative static results from changes not only in fiscal policy variables (as in previous editions) but also monetary policy changes. Instructors who value the rigour that comes from solving algebraic representations of the macroeconomic model will, with this edition, find a good deal more to support their preferred approach. The algebraic approach is also bolstered by a discussion, in Chapter 1, of the approach economists take to solving comparative static experiments.
- ***A Revised Chapter 9.*** Chapter 9 has undergone a significant revision with this edition. With this edition the *AS* curve has been completely removed from this chapter so that it can be focused solely on the model of the economy that assumes price expectations are exogenously determined. Those instructors who favour discussing macroeconomic outcomes within this framework before

moving to more advanced models will find, with this edition, a much deeper discussion. The concepts of the multiplier and investment crowding out have been moved forward into this chapter, whereas in earlier editions this discussion was left to Chapters 11 and 12.

- **A Revised Chapter 12.** With this edition our presentation of the Keynesian model of sticky nominal wages is enhanced by bringing into Chapter 12 the diagram of the labour market first introduced in Chapter 3. This enhancement clarifies to students—using a simple model they invested considerable effort to learn as a foundation for their understanding of productivity, output, and employment—why the Keynesian model of sticky wages is described as a non-market-clearing approach, and so identifies the most important distinction between the Keynesian and classical approaches to modelling the business cycle.

In addition to pedagogical changes, this edition introduces discussions of issues that have gained recent prominence (Chapter 3, page 74, in the Application “Output, Employment, and the Real Wage During Oil Price Shocks”) and made much clearer the significance and relevance of issues previously discussed (the “Twin Deficits”). We continue with this edition our emphasis on the importance of well-designed political, legal, and regulatory institutions for favourable macroeconomic outcomes and use as examples the recent experiences of economies during the 2008–2009 financial crisis.

In short, the seventh Canadian edition of *Macroeconomics* is tighter, more focused, and better designed to support instructors in making the most effective presentation of the macroeconomic models emphasized in intermediate macroeconomics courses.

A FLEXIBLE ORGANIZATION

The basic structure of the text is unchanged from previous editions. In Part I (Chapters 1 and 2), we introduce the field of macroeconomics and discuss issues of measurement. In Part II (Chapters 3 to 7), we focus on long-run issues, including productivity, saving, investment, growth, and inflation. We devote Part III (Chapters 8 to 12) to the study of short-run economic fluctuations and stabilization policy. Finally, although we discuss macroeconomic policy throughout the book, in Part IV (Chapters 13 to 15) we look at issues and institutions of policy-making in greater detail. In the Appendix at the end of the book, we review useful algebraic and graphical tools.

We recognize that instructors have different preferences about what to include in their courses and that their choices may be constrained by their students’ backgrounds and the length of the term. The text is designed to be flexible in accommodating these different needs. In planning how to use *Macroeconomics* in your course, you might find the following suggestions useful:

- **Core chapters.** We recommend that every course include these six chapters:
 - Chapter 1 Introduction to Macroeconomics
 - Chapter 2 The Measurement and Structure of the Canadian Economy
 - Chapter 3 Productivity, Output, and Employment
 - Chapter 4 Consumption, Saving, and Investment
 - Chapter 7 The Asset Market, Money, and Prices
 - Chapter 9 The *IS–LM–FE* Model: A General Framework for Macroeconomic Analysis

Chapters 1 and 2 provide an introduction to macroeconomics, including national income accounting. The next four chapters on the list make up the

analytical core of the book: Chapter 3 introduces the labour market, Chapters 3 and 4 together develop the goods market, and Chapter 7 discusses the asset market. Chapter 9 combines the three markets into a general equilibrium model usable for short-run analysis (in either classical or Keynesian mode).

To a syllabus containing the above six chapters, the instructor can add various combinations of other chapters according to the course focus. The following are some possible choices:

- ***International macroeconomic issues.*** Most instructors will want to add two open-economy chapters to the six chapters listed. Chapter 5 discusses saving, investment, and the trade balance in both small and large open economies with full employment. Chapter 10 discusses exchange-rate determination and macroeconomic policy in an open-economy model in which short-run deviations from full employment are possible. Each of these chapters directly follows its closed-economy partner.
- ***Short-run, fixed price focus.*** Instructors who prefer to emphasize short-run issues (business cycle fluctuations and stabilization policy) within the context of a fixed price model may omit Chapter 6 without loss of continuity. They could also go directly from Chapters 1 and 2 to Chapters 8 and 9, which introduce business cycles and the *IS-LM-FE* framework. Although the presentation in Chapters 8 and 9 is self-contained, it will be helpful for instructors who skip Chapters 3 to 7 to provide some background and motivation for the various behavioural relationships and equilibrium conditions.
- ***Short-run, flexible price focus.*** Instructors who want to build on the short-run model can deepen their analysis by adding Chapters 11 and 12. In these chapters the role of price expectations is introduced into the classical and the Keynesian models, allowing for examination of the implications of rational expectations for stabilization policies.
- ***Classical emphasis.*** For instructors who want to teach the course with a modern classical emphasis, Chapter 11 provides a self-contained presentation of classical business cycle theory. Other material of interest includes the Friedman–Phelps interpretation of the Phillips curve (Chapter 13), the role of credibility in monetary policy (Chapter 14), and Ricardian equivalence with multiple generations (Chapter 15).
- ***Keynesian emphasis.*** Instructors who prefer a Keynesian emphasis may omit Chapter 11 (classical business cycle analysis); however, they will find it useful to first present those sections of Chapter 11 that introduce and discuss the implications of the theory of rational expectations. As noted, if a short-run focus is preferred, Chapter 5 (full-employment analysis of the open economy) and Chapter 6 (long-term economic growth) may also be omitted without loss of continuity.

APPLYING MACROECONOMICS TO THE REAL WORLD

Economists sometimes get caught up in the elegance of formal models and forget that the ultimate test of a model or theory is its practical relevance. We dedicate a significant portion of each chapter to showing how the theory can be applied to real events and issues. Thus, we present additional information and topics that are designed to enhance students' understanding of the economic theories presented in that chapter "in boxes entitled 'A Closer Look' or 'Applications.'" Examples include

applications of data to the production function (Chapter 3), measuring the effect of changes to housing prices on consumption spending (Chapter 4), comparing Canadian and foreign levels of direct investment (Chapter 5), testing the predictions of the Solow model by examining whether economies converge (Chapter 6), and discussing the issues and complications involved in measuring the size of government debt (Chapter 15). Throughout the book we have provided the source of all data we have presented in graphs and tables. Providing this information enables instructors and students to update tables and figures and to find their own data series to answer questions related to those discussed in the text.

LEARNING AIDS

The text contains many features aimed at helping students understand, apply, and retain important concepts:

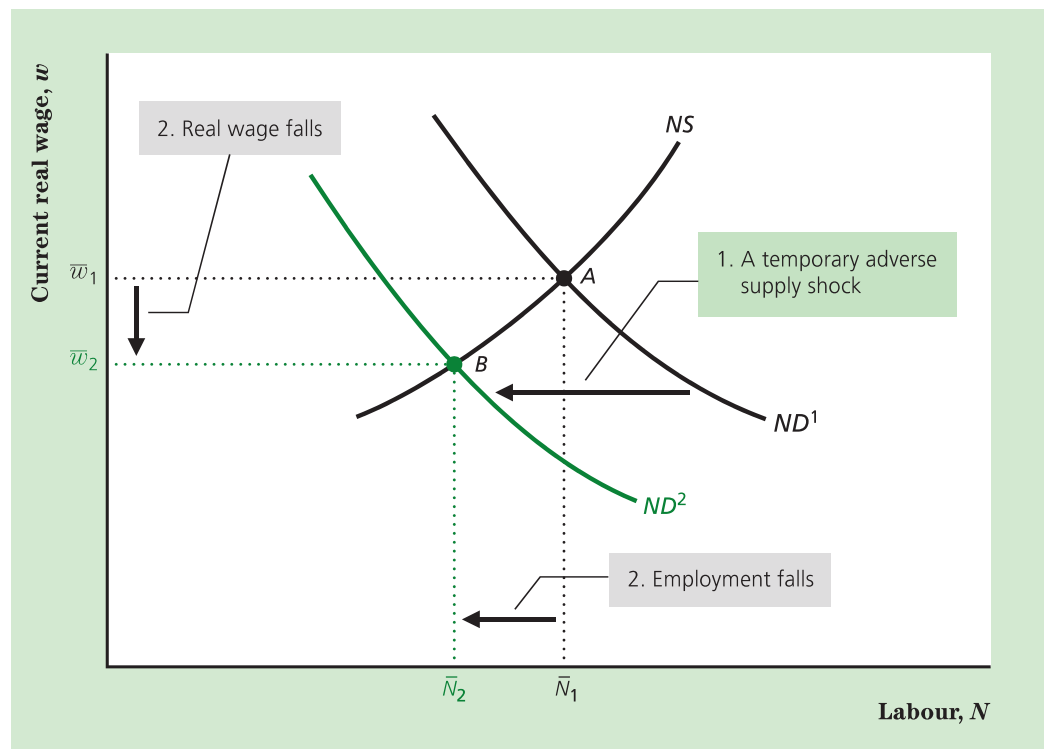
- Detailed, colour graphs.** The book is liberally illustrated with *data graphs*, which emphasize the empirical relevance of theory, and *analytical graphs*, which guide students through the development of model and theory in a well-paced, step-by-step manner. Both types of graphs include descriptive captions that summarize the details of events shown in the graph.

Our use of colour in analytical graphs is demonstrated in Figure 3.9, which shows the effects of a shifting curve on a set of endogenous variables. Note that the original curve is in black, and its new position is in teal, with arrows indicating the direction of the shift. A teal “shock box” indicates the reason for the shift, and a grey “result box” lists the main effects of the shock on endogenous variables. We consistently use these and similar conventions to make it easier for students to gain a clear understanding of the analysis.

- Key Diagrams.** Key Diagrams, a unique study feature found at the end of selected chapters, are self-contained descriptions of the most important

FIGURE 3.9
EFFECTS OF A TEMPORARY
ADVERSE SUPPLY SHOCK ON
THE LABOUR MARKET

An adverse supply shock that lowers the marginal product of labour (see Figure 3.3, p. 55) reduces the quantity of labour demanded at any real wage level. Thus, the labour demand curve shifts left, from ND^1 to ND^2 , and the labour market equilibrium moves from point A to point B . The adverse supply shock causes the real wage to fall from \bar{w}_1 to \bar{w}_2 and reduces the full-employment level of employment from \bar{N}_1 to \bar{N}_2 .



analytical graphs in the book (see the list in the Contents for their locations). For each Key Diagram we present the graph (the production function, Chapter 3, or the *IS-LM-FE* diagram, Chapter 9, for example) and define and describe its elements in words and equations. We then present an analysis of what the graph reveals and discuss the factors that shift the curves in the graph.

- **Summary tables.** Throughout the book summary tables compile the main results of analyses. These summary tables reduce the amount of time the student must spend learning and writing results, allowing a greater concentration on understanding and applying these results.
- **End-of-chapter review materials.** To facilitate review, at the end of each chapter the student will find a chapter summary, covering the chapter's main points; a list of key terms, with page references; an annotated list of key equations; and review questions for self-testing.
- **End-of-chapter problems.** An extensive set of problems for practice and review (more than 160 in all) includes *numerical problems*, which have explicit numerical solutions and are especially useful for checking students' understanding of basic relationships and concepts, and *analytical problems*, which ask students to use or extend theories qualitatively. Answers are provided in the Instructor's Manual.
- **Review of useful analytical tools.** Although we use no mathematics beyond high school algebra, some students will find helpful a review of the main analytical tools used in the book. The Appendix (at the end of the text) succinctly discusses functions of one and several variables, graphs, slopes, exponents, and formulas for finding the growth rates of products and ratios.
- **Glossary.** The Glossary at the end of the text includes definitions of all key terms (set in boldface in the chapters and listed at the end of each chapter) and refers the student to the page on which the term is fully defined and discussed.

SUPPLEMENTS

The following instructor supplements are available for downloading from a password-protected section of Pearson Canada's online catalogue (<http://catalogue.pearsoned.ca>). Navigate to your book's catalogue page to view a list of those supplements that are available. See your local sales representative for details and access.

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Chapter 1

Introduction to Macroeconomics

1.1 WHAT MACROECONOMICS IS ABOUT

Macroeconomics is the study of the structure and performance of national economies and of the policies that governments use to try to affect economic performance. The issues that macroeconomists address include the following:

- *What determines a nation's long-run economic growth?* In 1870, income per capita in Norway was smaller than in Argentina. But today, income per capita is more than twice as high in Norway as in Argentina. Why do some nations' economies grow quickly, providing their citizens with rapidly improving living standards, while other nations' economies are relatively stagnant?
- *What causes a nation's economic activity to fluctuate?* After 17 years of strong economic growth, the Canadian economy began to falter in 2008. By the end of 2009, output in Canada had fallen by 2% from its level at the end of 2007. Even if they grow on average, why do economies sometimes experience sharp short-run fluctuations, lurching between periods of prosperity and periods of hard times?
- *What causes unemployment?* During the 1930s, one-fifth of the workforce in Canada was unemployed. A decade later, during World War II, less than 2% of the workforce was unemployed. Why does unemployment sometimes reach very high levels? Why, even during times of relative prosperity, is a significant fraction of the workforce unemployed?
- *What causes prices to rise?* The rate of inflation in Canada crept steadily upward during the 1970s, and reached 11% per year in the early 1980s before dropping to 3% per year in the mid-1980s, and to less than 2% per year in the early 1990s. Germany's inflation experience has been much more extreme: Although Germany has earned a reputation for low inflation in recent decades, following its defeat in World War I it experienced an 18-month period (July 1922–December 1923) during which prices rose by a factor of several billion! What causes inflation, and what can be done about it?

- *How does being part of a global economic system affect nations' economies?* According to many observers, economic growth in Canada in the 1990s was boosted by rapid growth abroad, which added to the demand for Canadian products. On the other hand, in 2007 a crisis began to develop in the U.S. financial market that would quickly impact the Canadian economy by threatening the stability of Canadian financial institutions and causing a significant fall in Canadian exports. How do economic links between nations, such as international trade and borrowing, affect the performance of individual economies and the world economy as a whole?
- *Can government policies be used to improve a nation's economic performance?* Governments raise a great deal of revenue by taxing individuals and firms. We as citizens have deemed it appropriate that the government spend that revenue on goods and services. These include national defence, police, and education. How do government decisions about how to raise revenue—for example, by income taxes versus by borrowing—affect the overall economy? How do government spending choices—for example, on infrastructure as opposed to income support for the elderly—affect the economy? How should economic policy be conducted in order to keep the economy as prosperous and stable as possible?

Macroeconomics seeks to offer answers to such questions, which are of great practical importance and are constantly debated by politicians, the press, and the public. In the rest of this section, we consider these key macroeconomic issues in more detail.

LONG-RUN ECONOMIC GROWTH

If you've ever travelled in a developing country, you probably couldn't help but observe the difference in living standards relative to those of such countries as Canada. The problems of inadequate food, shelter, and health care experienced by the poorest citizens of rich nations often represent the average situation for the people of a developing country. From a macroeconomic perspective, the difference between rich nations and developing nations may be summarized by saying that rich nations have, at some point in their history, experienced extended periods of rapid economic growth but that poorer nations either have never experienced sustained growth or have had periods of growth offset by periods of economic decline.

In part, the long-term growth of the Canadian economy is the result of a rising population, which has meant a steady increase in the number of available workers. But another significant factor is the increase in the amount of output that can be produced with a given amount of labour. The amount of output produced per unit of labour input—for example, per worker or per hour of work—is called **average labour productivity**. Average labour productivity, defined in this case as output per employed worker, has changed a great deal over time. In 2012, for example, the average Canadian worker produced nearly six times as much output as the average worker in 1921, despite working fewer hours over the course of the year. Because today's typical worker is so much more productive, Canadians enjoy a significantly higher standard of living than would have been possible 90 years ago.

The rates of growth of output and, particularly, of output per worker ultimately determine whether a nation will be rich or poor; therefore, understanding

what determines growth is one of the most important goals of macroeconomics. Unfortunately, explaining why economies grow is not easy. Why, for example, did resource-poor Japan and South Korea experience growth rates that transformed them in a generation or two from war-torn nations to industrial powers, whereas several resource-rich nations of Latin America and Africa have had erratic or even negative growth in recent years? Although macroeconomists have nothing close to a complete answer to the question of what determines rates of economic growth, they do have some ideas to offer. In Chapter 6 we will present a model that economists use to try to better understand why over the course of many decades some economies grow faster than others. As rising output is closely correlated with improved living standards, it is small wonder that this area of study has been a focus of macroeconomists for a long time.¹

BUSINESS CYCLES

The history of Canadian output is one of steady growth when measured over the long term but growth that is sometimes interrupted by short periods of slower (and sometimes negative) growth and short periods of more rapid growth. These periods of slower than normal and faster than normal growth are known by economists as *business cycles*; short, but sometimes sharp, contractions and expansions in economic activity.²

The most volatile period in the history of Canadian output was between 1914 and 1945, a period marked by two world wars and the two deepest recessions in Canadian history, the second of which was so severe that it is known as the Great Depression. During the Great Depression the unemployment rate in Canada exceeded 20%, a level of unemployment not experienced since. But even relatively mild downturns in the economy, known as recessions, mean hard economic times for many people. Not surprisingly, recessions are a major concern for politicians; after all, almost every politician wants to be re-elected, and his or her chances are better if the country's economy is expanding rather than declining.

Macroeconomists put a lot of effort into trying to determine what causes business cycles and deciding what can or should be done about them. In Chapter 8 we describe the features of business cycles in Canada, and in Chapters 9–12 we compare different macroeconomic explanations for cyclical fluctuations. Using those explanations as a guide, we also evaluate the policy options that are available for mitigating the negative effects of the business cycle.

UNEMPLOYMENT AND PRICE INSTABILITY

The hard economic times suffered by people over the course of a business cycle are felt in many ways, both personal and economic. At a macroeconomic level, the economic costs are often measured by two key variables: unemployment and price instability.

¹ In Chapters 6 and 8 we will look at data describing Canada's economic growth over more than a century. In Chapter 8 we will also look at data describing average labour productivity over the past half-century.

² A more exact definition is given in Chapter 8, where we also provide the dates when contractions and expansions have started and ended in Canada.

By an increase in **unemployment** we mean an increase in the number of people who are available and actively seeking employment but who are unable to find a job. Finding oneself unable to earn a living and support one's family is an obvious and serious hardship. Less obvious, perhaps, is the hardship suffered when the economy experiences volatility in the rate of growth in prices. Price instability can take either of two forms. **Inflation** is an ongoing increase in the prices of goods and services. **Deflation** is an ongoing decrease in prices. Canadians who lived through the high rates of inflation (in excess of 10% per year) during the 1970s and an older generation who lived during the Great Depression and saw prices (and wages) fall by 6% per year know that there are significant costs to be borne. So policymakers continually guard against threat of prolonged periods of deflation, such as Japan has experienced since the 1990s, and the opposite threat of runaway inflation, such as that observed in recent years in countries like Zimbabwe, where prices have risen so quickly that economists have labelled it "hyperinflation."

We look closely at the determinants of unemployment and inflation, and the relationship between the two, in Chapter 13. To better our understanding of inflation, in Chapter 7 we examine the role of money and the crucial role of financial institutions in the economy.

THE INTERNATIONAL ECONOMY

Today, every major economy is an **open economy**, or one that has extensive trading and financial relationships with other national economies. (A **closed economy** does not interact economically with the rest of the world.) Macroeconomists study patterns of international trade and borrowing to better understand the links among national economies. For example, an important topic in macroeconomics is how international trade and borrowing relationships can help transmit business cycles from country to country.

The Canadian economy has always been heavily dependent on international trade in goods and services. Being able to sell goods abroad (that is, to **export**) is an advantage to Canadian manufacturers, as they are able to grow far larger than they would were they dependent on selling only to the relatively small Canadian market. Being able to buy goods from other countries (to **import**) is a great advantage for Canadian consumers, who are as a result able to choose from the best the world has to offer. Imagine how much poorer Canadians would be without the ability to purchase fresh fruit imported from Mexico during the winter months, or how much poorer Canadian wheat farmers would be without the ability to grow amounts of wheat far in excess of Canadian needs and export the rest of their crop to other countries.

The value of goods and services that Canadian firms export and the value of goods and services Canadians import need not be the same. When the value of exports exceeds the value of imports, a **trade surplus** exists. When the opposite occurs, when value of imports exceeds the value of exports, a **trade deficit** exists. An important influence on the trade balance is the **exchange rate**. The exchange rate is the number of Canadian dollars that can be purchased with one unit of foreign currency. Although exchange rates are quoted between many currencies, the Canada–U.S. exchange rate is the most important to Canada because of the very large volume of trade between the two countries.

The development of the Canadian economy has been heavily influenced by the free flow of financial capital across international borders. During the 1870s, when

Canada was building intercontinental railways and the infrastructure of a new country, and again during the 1950s and 1960s, when the Canadian economy was growing quickly thanks to external demand for our natural resources, it was the savings of foreigners that was funding these investments. More recently, Canadian savers have benefited from being able to invest in fast-growing countries like China and India.

The long-term impact of international trade and the inflow and outflow of financial capital on the Canadian economy is the focus of Chapter 5. The role of trade and financial flows (including the crucial role played by exchange rates) in the Canadian business cycle is the subject of Chapter 10.

MACROECONOMIC POLICY

A nation's economic performance depends on many factors, including its natural and human resources, its capital stock (buildings and machines), its technology, and the economic choices made by its citizens, both individually and collectively. Another important factor affecting economic performance is the set of macroeconomic policies pursued by the government.

Macroeconomic policies attempt to affect the performance of the economy as a whole. The two major types of macroeconomic policies are fiscal policy and monetary policy. **Fiscal policy**, which is determined at the federal, provincial, and municipal levels, concerns government spending and taxation. **Monetary policy**, which is under the control of a government institution known as the central bank, affects short-term interest rates and the growth rate of the nation's money supply. In Canada, the central bank is the Bank of Canada.

The fiscal policy choices made by governments play a huge role in our daily lives. These choices determine, for example, the level and type of taxes we pay. As well, these choices matter for determining who pays these taxes: What share of taxes is paid by high-income Canadians and what share, if any, is paid by those with low incomes? Fiscal policy choices also matter for funding health care, education, and social assistance. Finally, fiscal policy choices involve decisions about the size of government deficits (the imbalance between government spending and revenues) and debt (the accumulation of annual budget imbalances). Fiscal policy choices—along with the constraint put on those choices by the reluctance of Canadians to pay taxes and the critical importance of interest rates for indebted governments—are the focus of Chapter 15. Fiscal policy choices are central to our discussion in Chapters 9–12 as well because these choices may matter for how our governments respond to the business cycle.

The choices made by the Bank of Canada with respect to monetary policy are also important to our daily lives. The interest rate paid on a student loan, car loan, or mortgage is determined by monetary policy. So too is the rate of return earned on savings toward retirement. The crucial role of monetary policy choices in ensuring the stability of financial institutions—and so protecting the savings of households—was highlighted during the world financial crisis of 2007–2009. For reasons like these, most macroeconomists agree that monetary policy plays a pivotal role in determining the success of a modern industrialized economy like Canada's. Developing an understanding of monetary policy is the focus of Chapters 7 and 14. And, like fiscal policy, monetary policy choices are central to our discussion in Chapters 9–12 because these choices may matter for how our governments respond to the business cycle.

AGGREGATION

Macroeconomics is one of two broad areas within the field of economics, the other being microeconomics. Macroeconomics and microeconomics have many basic economic ideas and methods in common; the difference between them is the level at which the economy is studied. Microeconomists focus on individual consumers, workers, and firms, each of whom is too small to have an impact on the national economy. 2306513 2015/12/28 118.248.179.19 Macroeconomists ignore the fine distinctions among the many different kinds of goods, firms, and markets that exist in the economy and, instead, focus on national totals. For example, in their analyses, macroeconomists don't care whether consumers are buying an iPhone or a BlackBerry, beef or chicken, Pepsi or Coke. Instead, they add consumer expenditures on all goods and services to get an overall total called aggregate consumption. The process of summing individual economic variables to obtain economywide totals is called **aggregation**. The use of aggregation and the emphasis on aggregate quantities, such as aggregate consumption, aggregate investment, and aggregate output, are the primary factors that distinguish macroeconomics from microeconomics.

1.2 WHAT MACROECONOMISTS DO

How do macroeconomists use their skills, and what do they do with all the data they gather and the theories they develop? Besides teaching economics, macroeconomists engage in a wide variety of activities, including forecasting, macroeconomic analysis, and basic research.

MACROECONOMIC FORECASTING

Many people believe that economists spend most of their time trying to forecast the performance of the economy. In fact, except for a relatively small number of forecasting specialists, forecasting is a minor part of what macroeconomists do. One reason macroeconomists don't emphasize forecasting is that on the whole, they're not terribly good at it! Although short-range forecasters have some success, long-range forecasting is difficult, not only because our understanding of how the economy works is imperfect but also because of the impossibility of taking into account *all* the factors—many of them not strictly economic—that might affect future economic trends. Here are some questions that a forecaster, in trying to project the course of the economy, might have to try to answer: What oil price will the Organization of the Petroleum Exporting Countries (OPEC) decide on at its next meeting? Will there be a severe drought in agricultural regions, with adverse effects on food quantities and prices? When will new technologies that are being developed come to market? Because answers to such questions are highly uncertain, macroeconomic forecasters rarely offer a single prediction. Instead, they usually combine a “most likely” forecast with “optimistic” and “pessimistic” alternative scenarios.

Does the fact that macroeconomics can't be used to make highly accurate forecasts of economic activity mean that it's a pointless field of study? Some people may think so, but that's really an unreasonable standard. Meteorology is an example of a field in which forecasting is difficult (will it *definitely* be nice this weekend?) but in which there is also a lot of useful knowledge (meteorologists

helped discover the depletion of the earth's ozone layer and pointed out its dangers). Similarly, cardiologists cannot usually predict if or when a patient will have a heart attack—they can only talk about probabilities. Like meteorologists and doctors, economists deal with a system whose complexity makes gaining a thorough understanding difficult and forecasting the system's behaviour even more difficult. Rather than predicting what will happen, most macroeconomists are engaged in analyzing and interpreting events as they happen (macroeconomic analysis) or in trying to understand the structure of the economy in general (macroeconomic research).

MACROECONOMIC ANALYSIS

Macroeconomic analysts monitor the economy and think about the implications of current economic events. Many analysts are employed in the private sector, such as in banks or large corporations. Private sector analysts try to determine how general economic trends will affect their employers' financial investments, their opportunities for expansion, the demand for their products, and so on.

The public sector, which in Canada includes the federal, provincial, and municipal governments, the Bank of Canada, and international agencies such as the World Bank and the International Monetary Fund, also employs many macroeconomic analysts. The main function of public sector analysts is to assist in policymaking—for example, by writing reports that assess various macroeconomic problems and by identifying and evaluating possible policy options. Among Canadian policymakers, the officials who set monetary policy may call on the aid of economists employed by the Bank of Canada, and federal and provincial cabinets have the advice of the professional staffs of numerous departments and agencies. Economic policymakers also often go outside the government to seek the advice of macroeconomists from business or academia.

If a country has many well-trained macroeconomic analysts, as is true in Canada, does that mean its macroeconomic policies will always be intelligent and farsighted? The answer, unfortunately, is no. Because of the complexity of the economy, macroeconomic policy analysis, like macroeconomic forecasting, is often difficult and uncertain. Perhaps even more important, though, *politicians, not economists, usually make economic policy*. Politicians are typically less concerned with the abstract desirability of a policy than with the policy's immediate effects on their constituents. Thus, in recent years, international talks intended to reduce trade barriers have sometimes failed because the governments of many developed countries found it politically inadvisable to reduce high subsidy payments to their farmers—despite economists' nearly universal opposition to both trade barriers and farm price support payments.

Although the technical advice provided by macroeconomic analysts isn't the sole basis on which macroeconomic policy is made, such advice is probably necessary for making good policy decisions, especially if dramatic changes are being considered. In recent years, for example, a number of countries in Eastern Europe have undertaken significant and successful reforms of their economies, reforms that have been guided by the advice of macroeconomic analysts to open markets to trade, to minimize tax rates and inflation, and so on. In Venezuela and Zimbabwe, on the other hand, radical changes have been introduced despite those changes being universally dismissed by macroeconomic analysts as harmful to those nations' economies.

MACROECONOMIC RESEARCH

Macroeconomic research takes an amazing variety of forms, from abstract mathematical analysis to psychological experimentation to massive number-crunching projects in which supercomputers are used to process large amounts of economic data. Nevertheless, the goal of all macroeconomic research is to make general statements about how the economy works. The general insights about the economy gained from successful research form the basis for the analyses of specific economic problems, policies, or situations.

How is macroeconomic research carried out? As in many other fields, macroeconomic research proceeds primarily through the formulation and testing of theories. An **economic theory** is a set of ideas about the economy that has been organized in a logical framework. Most economic theories are developed in terms of an **economic model**, which is a simplified description of some aspect of the economy, usually expressed in mathematical form. Economists evaluate an economic model or theory by applying four criteria:

1. Are its assumptions reasonable and realistic?
2. Is it understandable and manageable enough to be used in studying real problems?
3. Does it have implications that can be tested by **empirical analysis**? That is, can its implications be evaluated by comparing them with data obtained in the real world?
4. When the implications and the data are compared, are the implications of the theory consistent with the data?

For a theory or model—of any type, not just economic—to be useful, the answer to each of these questions must be yes. Unfortunately, though, economists may not always agree in their evaluation of a particular model, which means that controversies about the best way to model a given economic situation sometimes persist.

We present a summary of the main steps in developing and testing an economic theory or model in A Closer Look 1.1 (p. 9).

At the heart of any economic theory are descriptions of how our economic *actors*—households, firms, and government—make the choices they do. For example, what prompts members of a household to offer to work a certain number of hours per day but not more or less than that, and what motivates a firm to hire additional workers? These are questions we examine in Chapter 3. How does a change in income, interest rates, or wealth influence the decision of how many goods and services to purchase? What does this mean for saving? Why does a firm choose to invest in new machinery or factories? These questions are the focus of Chapter 4. What motivates government to raise or lower taxes and how does the Bank of Canada respond to increases in inflation? Chapters 14 and 15 look at these important issues.

Having developed an economic theory that summarizes how economic actors are predicted to respond to changes in their economic environment, a macroeconomist is able to conduct experiments. For the most part, macroeconomists are not allowed to run experiments in the manner of physicists or chemists. That is, we're not allowed to conduct experiments on our "subjects" because they are human beings and companies as opposed to the molecules and atoms that are the

A CLOSER LOOK 1.1

DEVELOPING AND TESTING AN ECONOMIC THEORY

To illustrate the process of developing and testing an economic theory, suppose that we want to develop a theory that explains the routes people take when they commute from home to work and back. Such a theory would be useful, for example, to a traffic planner who is concerned about how a proposed housing development will affect traffic patterns. Here are the steps we would take:

STEP 1. State the research question.

EXAMPLE: What determines traffic flows in the city during rush hours?

STEP 2. Make provisional assumptions that describe the economic setting and the behaviour of the economic factors. These assumptions should be simple yet capture the most important aspects of the problem.

EXAMPLE: The setting is described by the map of the city. The assumption about behaviour is that commuters choose routes that minimize driving time.

STEP 3. Work out the implications of the theory.

EXAMPLE: Use the map of the city to plot a route that minimizes driving time between home and place of work.

STEP 4. Conduct an empirical analysis to compare the implications of the theory with the data.

EXAMPLE: Conduct a survey of commuters to identify (1) home locations; (2) work locations; and (3) routes taken to work. Then, see whether the routes predicted by the model are generally the same as those reported in the commuter survey.

STEP 5. Evaluate the results of your comparisons.

If the theory fits the data well: Use the theory to predict what would happen if the economic setting or economic policies change.

EXAMPLE: Use the minimum-driving-time assumption to evaluate the traffic effects of a new housing development by figuring out which routes the residents of the development are likely to take.

If the theory fits the data poorly: Start from scratch with a new model. Repeat steps 2 through 5.

EXAMPLE: Change the provisional behavioural assumption to the following: Commuters choose the route that minimizes the distance they must drive (not the time they spend driving).

If the theory fits the data moderately well: Either make do with a partially successful theory or modify the model with additional assumptions and then repeat steps 3 through 5.

EXAMPLE: A possible modification of the minimum-driving-time assumption is that commuters will choose more scenic over less scenic routes, if driving time is not increased by more than a certain number of minutes. To test the model with this modified assumption, you must determine which routes are more scenic (those that pass a lake) and which are less scenic (those that pass a garbage dump).

subject of experiments in physics and chemistry.³ Instead, macroeconomists conduct their experiments using their economic models. In fact, we'll be conducting many such experiments in this book.

The experiments conducted by macroeconomists are called **comparative static experiments**. They are conducted in the following way. *First*, the economic model is assumed to be in **equilibrium**. That is to say, we begin by assuming a

³ Having said that, microeconomists are sometimes allowed to run experiments on humans. From 1974 to 1979 economists were let loose to run an experiment (called MINCOME) in which the residents of the town of Dauphin, Manitoba, were given the opportunity to participate in an economic experiment: a family with no income would receive a payment equal to 60% of a measure of poverty. The aim of the experiment was to determine how this unconditional income might affect people's decision about how much to work and how it might affect poverty levels. For an interesting discussion and analysis of this experiment, see Evelyn Forget, "The Town with No Poverty: The Health Effects of a Canadian Guaranteed Annual Income Field Experiment," *Canadian Public Policy*, Volume 37, No. 3, September 2011, pp. 283–305.

situation in which the quantities demanded and supplied are equal in all markets. Thus, households and firms are consuming and producing, working and employing, and saving and investing amounts they deem optimal given their incomes and profits. *Second*, we change the value of one variable in the model, a variable whose value is not affected by changes in other variables in the model. This might be, for example, a change in weather conditions affecting wheat yields or the discovery of a giant new oil field in Mexico that will compete with Canadian production. Economists refer to events such as these as **shocks**. To the extent that fiscal and monetary policy choices are unexpected by households and firms and are not in turn influenced by how households and firms respond, these too can be considered to be shocks to the economy. *Third*, we observe how our macroeconomic model responds to the shock. In particular, we observe how the shock alters the equilibrium to which households and firms adjust. In this way, we determine how the particular shock we introduced into the model affects the choices of households and firms and so affects the whole economy. We will use comparative static experiments throughout this book in order to determine how unexpected events, and the possible fiscal and monetary policy responses to those events, impact the economy.

1.3 WHY MACROECONOMISTS DISAGREE

Over the years, the efforts of thousands of analysts, data collectors, and researchers have greatly enhanced the understanding of macroeconomic phenomena. Yet, no matter what the macroeconomic issue, the news media seem to be able to find an economist to argue either side of it. Why do macroeconomists appear to disagree so much?⁴

To a certain extent, the amount of disagreement among macroeconomists is exaggerated by the tendency of the public and the media to focus on the most difficult and controversial issues. In addition, the very fact that economic policy and performance are of such broad interest and concern contributes to the intensity of debate. More than controversies in many other fields, debates in macroeconomics tend to take place in public rather than in the seminar room or the laboratory. Although important disagreements among macroeconomists certainly exist, there are also many areas of substantial agreement in macroeconomics.

We can provide an insight into why macroeconomists disagree by drawing the important distinction between positive and normative analyses of economic policy. A **positive analysis** of an economic policy examines the economic consequences of a policy but does not address the question of whether those consequences are desirable. A **normative analysis** of policy tries to determine whether a certain policy *should* be used. For example, if an economist is asked to evaluate the effects on the economy of a 5% rise in the income tax, the response involves a positive analysis. But if asked whether the income tax *should* be raised 5%, the economist's response requires a normative analysis. This normative analysis will involve not only the economist's objective, scientific understanding of how the economy works but also personal value judgments—for example, about the appropriate size of the government sector or the amount of income redistribution that is desirable.

⁴ Not only do macroeconomists often seem to disagree with each other, but they're also sometimes accused of not being able to agree with themselves. U.S. president Harry Truman expressed the frustration of many policymakers when he said he wanted a one-handed economist—one who wouldn't always say, "On the one hand . . . ; on the other hand . . ."

Economists may agree on the positive analysis of a question yet disagree on the normative part because of differences in values. Value differences are, of course, common in other fields as well: Physicists, for example, may be in perfect agreement on what would happen *if* a nuclear bomb were detonated (a positive analysis), but physicist “hawks” and physicist “doves” may disagree strongly about whether nuclear weapons *should* be deployed (a normative question).

Disagreement may occur on positive issues, however, and these differences are important in economics. In macroeconomics, there have always been many schools of thought, each with a somewhat different perspective on how the economy works; one example is monetarism, which we discuss in this book. However, the most important—and enduring—disagreements on positive issues in macroeconomics involve the two schools of thought called the classical approach and the Keynesian approach.

CLASSICALS VERSUS KEYNESIANS

The classical approach and the Keynesian approach are the two major intellectual traditions in macroeconomics. We discuss the differences between the two approaches briefly here, and in much greater detail later in the book.

The Classical Approach

The origins of the classical approach go back more than two centuries, at least to the famous Scottish economist Adam Smith. In 1776 Smith published his classic work, *The Wealth of Nations*, in which he proposed the concept of the “invisible hand.” The idea of the **invisible hand** is that if there are free markets and individuals conduct their economic affairs in their own best interests, the overall economy will work well. As Smith put it, in a market economy, individuals, while pursuing their own self-interest, seem to be led by an invisible hand to maximize the general welfare of everyone in the economy.

However, we must not overstate what Smith claimed: To say that an invisible hand is at work does *not* mean that no one in a market economy will be hungry or dissatisfied; free markets cannot insulate a nation from the effects of drought, war, or political instability. Nor does the invisible-hand idea rule out the existence of great inequalities between the rich and the poor: In Smith’s analysis, the initial distribution of wealth among people was accepted as a given. The invisible-hand idea says that given a country’s resources (natural, human, and technological) and its initial distribution of wealth, the use of free markets will make people as economically well off as possible.

The validity of the invisible-hand idea depends on a key assumption: The various markets in the economy, including financial markets, labour markets, and markets for goods and services, must function smoothly and without impediments, such as minimum wages and interest rate ceilings. In particular, wages and prices must adjust rapidly enough to maintain equilibrium in all markets. In markets where quantity demanded exceeds quantity supplied, prices must rise to bring the market into equilibrium. In markets where more of a good is available than people want to buy, prices must fall to bring the market into equilibrium.

Wage and price flexibility is crucial to the invisible-hand idea because in a free-market system, changes in wages and prices are the signals that coordinate the actions of people in the economy. To illustrate, suppose that war abroad disrupts foreign oil production. This drop in supply will drive up the

price of oil. A higher oil price will make it profitable for domestic oil suppliers to pump more oil and to drill more wells. The higher price will also induce domestic consumers to conserve oil and to switch to alternative sources of energy. Increased demand for alternative energy sources will raise their prices and stimulate *their* production, and so on. Thus, in the absence of such impediments as government-imposed price controls, the adjustment of prices helps the free-market economy respond in a constructive and coordinated way to the initial disruption of supplies.

The classical approach to macroeconomics builds on Smith's basic assumptions that people pursue their own economic self-interests and that prices adjust reasonably quickly to achieve equilibrium in all markets. With these two assumptions as a basis, followers of the classical approach attempt to construct models of the macroeconomy that are consistent with the data and that can be used to answer the questions raised at the beginning of this chapter.

The use of the classical approach carries with it some strong policy implications. Because the classical assumptions imply that the invisible hand works well, classical economists often argue (as a normative proposition) that the government should have, at most, a limited role in the economy. As a positive proposition, classical economists also often argue that government policies will be ineffective or counterproductive at achieving their stated goals. Thus, for example, most classicals believe that the government should not actively try to eliminate business cycles.

The Keynesian Approach

Compared with the classical approach, the Keynesian approach is relatively recent. The book that introduced it, *The General Theory of Employment, Interest, and Money*, by British economist John Maynard Keynes, appeared in 1936—160 years after Adam Smith's *The Wealth of Nations*. In 1936, the world was suffering through the Great Depression. Unprecedentedly high rates of unemployment had afflicted most of the world's economies for years, and the invisible hand of free markets seemed completely ineffective. From the viewpoint of 1936, the classical theory appeared to be seriously inconsistent with the data, creating a need for a new macroeconomic theory. Keynes provided this theory.

In his book, Keynes offered an explanation for persistently high unemployment.⁵ He based this explanation on an assumption about wage and price adjustment that was fundamentally different from the classical assumption. Instead of assuming that wages and prices adjust rapidly to achieve equilibrium in each market, as in the classical tradition, Keynes assumed that wages and prices adjust slowly. Slow wage and price adjustment meant that markets could be out of equilibrium—with quantities demanded not equal to quantities supplied—for long periods of time. In the Keynesian theory, unemployment can persist because wages and prices do not adjust quickly enough to equalize the number of people firms want to employ with the number of people who want to work. While adherents of the Keynesian approach recognize that wages and prices will eventually adjust to equate demand and supply, they believe that this adjustment might be slow to occur. The famous quotation of John Maynard Keynes, that “in the long run we're all dead,” makes the point that it might not be good government policy to

⁵ Actually, Keynes presented a number of explanations of unemployment in his book, and debate continues about “what Keynes really meant.” Our interpretation of what Keynes meant is the one adopted by his major followers.

wait for that eventual adjustment in wages and prices. He therefore proposed that governments take actions to alleviate the unemployment resulting from the slow adjustment of wages and prices.

Keynes's proposed solution to high and persistent unemployment was to have the government increase its purchases of goods and services, thus raising the demand for output. Keynes argued that this policy would reduce unemployment because in order to meet the higher demands for their products, businesses would have to employ more workers. In addition, Keynes suggested, the newly hired workers would have more income to spend, creating another source of demand for output that would raise employment further. More generally, in contrast to classicals, Keynesians tend to be skeptical about the ability of the invisible hand to maintain equilibrium at every point in time. They believe that disequilibrium may persist, and that this provides the rationale for governments to possibly intervene in the economy to speed adjustment and so improve macroeconomic performance.

A UNIFIED APPROACH TO MACROECONOMICS

In writing this book, we needed a strategy to deal with the fact that there are two major macroeconomic schools of thought. One strategy would have been to emphasize one of the two schools of thought and to treat the other only briefly. The problem with that strategy is that it wouldn't expose you to the full range of ideas and insights that make up modern macroeconomics. Alternatively, we might have presented the two approaches separately and then compared and contrasted their conclusions, but then you would have missed the opportunity to explore the large common ground shared by the two schools of thought.

Our choice was to take an approach to macroeconomics that is as balanced and unified as possible. In keeping with this unified approach, all our analyses in this book—whether of economic growth, business cycles, inflation, or policy, and whether classical or Keynesian in spirit—are based on a single economic model, or on components or extensions of the basic model. This economic model, which draws heavily from both the classical and Keynesian traditions, has the following characteristics:

1. *Individuals, firms, and the government interact in goods markets, asset markets, and labour markets.* We have already discussed the need for aggregation in macroeconomics. In the economic model of this book, we follow standard macroeconomic practice and aggregate all the markets in the economy into three major markets: the market for goods and services, the asset market (in which assets, such as stocks, bonds, and real estate, are traded), and the labour market. We show how participants in the economy interact in each of these three markets and how these markets relate to each other and the economy as a whole.
2. *The model's macroeconomic analysis is based on the analysis of individual behaviour.* Macroeconomic behaviour reflects the behaviours of many individuals and firms interacting in markets. To understand how individuals and firms behave, we take a "bottom-up" approach and focus our analysis at the level of individual decision making (as in A Closer Look 1.1, p. 9, where we discuss a model of individual choices about the route to take to work). The insights gained are then used for studying the economy as a whole.