

SAYRE // MORRIS

PRINCIPLES OF
MACROECONOMICS



EIGHTH EDITION

World's Highest Unemployment Rates

Rank	Country	Unemployment Rate (%)
1	Macedonia	31
2	Kosovo	31
3	Bosnia & Herzegovina	28
4	South Africa	25
5	Spain	25
6	Greece	24
7	Serbia	24
8	West Bank & Gaza	23
9	Montenegro	20
10	Namibia	17

Source: World Bank: World Development Indicators 2014.

World's Richest Countries

Rank	Country	GNI per capita (in \$US)
1	Norway	\$ 66 960
2	Luxembourg	60 160
3	Singapore	60 110
4	Switzerland	55 090
5	United States	52 610
6	Hong Kong	52 190
7	Sweden	43 980
8	Netherlands	43 510
9	Denmark	43 430
10	Austria	43 390
11	Canada	42 530

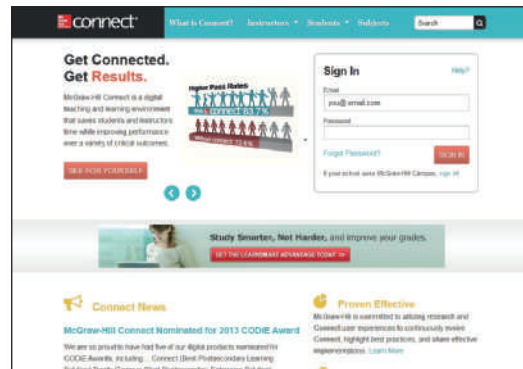
Source: World Bank: World Development Indicators 2014. Gross national income based on the purchasing power of each country's currency.

World's Poorest Countries

Rank	Country	GNI per capita (in \$US)
1	Congo, Democratic Republic of	\$ 390
2	Eritrea	550
3	Burundi	550
4	Liberia	580
5	Malawi	730
6	Niger	760
7	Togo	900
8	Madagascar	930
9	Guinea	970
10	Mozambique	1000

Source: World Bank: World Development Indicators 2014. Gross national income based on the purchasing power of each country's currency.

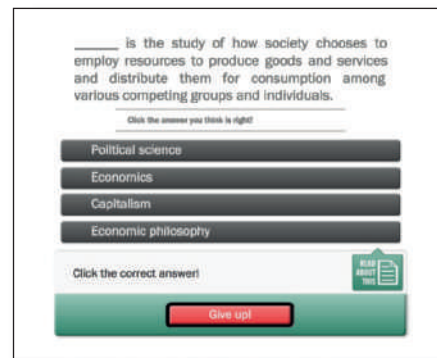
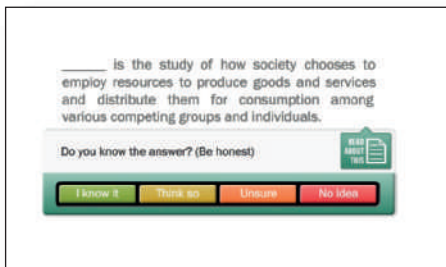
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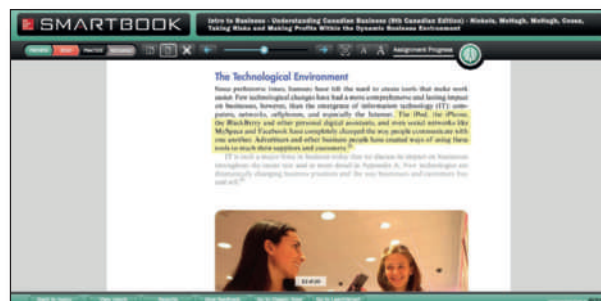
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PRINCIPLES OF
MACROECONOMICS

EIGHTH EDITION

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PRINCIPLES OF MACROECONOMICS

Eighth Edition

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To Daria: may the
blessings be
(JES)

————— A N D —————

To the ones I love:
Brian, Trevor, and in memory of Jean
(AJM)



ABOUT THE AUTHORS

John E. Sayre earned a BSBA at the University of Denver and an MA from Boston University. He began teaching principles of economics while in the Peace Corps in Malawi. He came to Vancouver to do PhD studies at Simon Fraser University and ended up teaching at Capilano University for the next thirty-nine years. John was honoured with the designation of Professor Emeritus by Capilano University in June of 2014. Now retired from Capilano, John is an avid golfer who also enjoys walking, listening to a wide range of music, and doing volunteer work.

Alan Morris, though loath to admit it, first worked as an accountant in England, where he became an Associate of the Chartered Institute of Secretaries and obtained his first degree in 1971 in Manchester, U.K. He subsequently obtained his Master's degree at Simon Fraser University, B.C., in 1973. He worked on his doctorate at Leicester University, U.K., and returned to work in business in Vancouver, B.C., until his appointment at Capilano University in 1988. He currently lives in North Vancouver and is an avid devotee of classical music, birding, soccer, and beer. To his knowledge, he has never been an advisor to the Canadian government.



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PREFACE

TO THE STUDENTS

So, you may well ask, why take a course in economics? For many of you, the obvious answer to this question is, “Because it is a requirement for the program or educational goal that I have chosen.” Fair enough. But there are other reasons. It is a simple truth that if you want to understand the world around you, then you have to understand some basic economics. Much of what goes on in the world today is driven by economic considerations, and those who know nothing of economics often simply cannot understand why things are the way they are. In this age of globalization, we are all citizens of the world and we need to function effectively in the midst of the enormous changes that are sweeping across almost every aspect of the social/political/economic landscape. You can either be part of this, and all the opportunities that come with it, or not be part of it because you cannot make any sense of it.

It is quite possible that you feel a little apprehensive because you have heard that economics is a difficult subject. Though there may be a grain of truth in this, we are convinced that almost any student can succeed in economics. But it will require some real work and effort on your part. Here are some tips on the general approach to this course that you might find helpful. First, read the **Economics Toolkit** that appears at the beginning of the book. The section titled The Canadian Reality offers basic information on Canada and its economic picture. Graphing Reality gives a quick lesson on graphs, which are an essential part of economics. These two sections will give you a solid foundation on which to build your knowledge of economics.

Second, before each lecture, quickly look over the chapter that will be covered. In this preliminary survey, you do not need to worry about the glossary boxes, the *Test Your Understanding* questions, or the integrated Study Guide. Third, take notes as much as you can during the lecture because the process of forcing yourself to express ideas *in your own words* is a crucial stage in the learning process. Fourth, re-read the chapter, again taking notes and using your own words (do not just copy everything word for word from the text). While doing this, refer to your classroom notes and try to integrate them into your reading notes. After you finish this, you will be ready to take on the Study Guide. As painful as it may be for you to hear this, we want to say loud and clear that you should do *all* of the questions and problems in the Study Guide. You may be slow at first, but you will be surprised at how much faster you become in later chapters. This is a natural aspect of the learning process. It might be helpful for you to get together with one or two other students and form a study group that meets once or twice a week to do economics Study Guide questions. You will be amazed to find that explaining an answer to a fellow student is one of the most effective learning techniques. If you ever come across a question that you simply cannot understand, this is a sure sign that you need to approach your instructor (or teaching assistant) for help. Do not get discouraged when this happens, and realize that it will probably happen more at the beginning of your process of learning economics than later on in the term. We are convinced that if you follow this process consistently, beginning in the very *first* week of class, you will succeed in the course—and not only succeed, but most likely do well. All it takes is effort, good time management, and consistent organization.

Finally, an enormous part of becoming educated involves gaining self-confidence and a sense of accomplishment. Getting an A in a “tough” economics course can be a great step in this direction. We wish you all the best.

TO THE INSTRUCTORS

General Philosophy

Over the years, we have become increasingly convinced that most economics textbooks are written to impress other economists rather than to enlighten beginning students. Such books tend to be encyclopedic in scope and intimidating in appearance. Small wonder, then, that students often emerge from an economics course feeling that the discipline really is daunting and unapproachable. We agree that the study of economics is challenging, but our experience is that students can also see it as intriguing and enjoyable if the right approach is taken. It is our belief that this right approach starts with a really good textbook that is concise without sacrificing either clarity or accepted standards of rigour.

In writing this text, we attempted to stay focused on four guiding principles. The first is to achieve a well-written text. We have tried to write as clearly as possible, to avoid unnecessary jargon, to speak directly to the student, and to avoid unnecessary abstraction and repetition.

Of equal importance, our second principle is a focused emphasis on student learning. Many years of teaching the principles courses have convinced us that students *learn* economics by *doing* economics. To this end, *Test Your Understanding* questions are positioned throughout each chapter. This encourages students to apply what they have just read and gives them continuous feedback on their comprehension of the material being presented. Further, we feel that we offer the most comprehensive and carefully crafted Study Guide on the market, which has evolved over the years as a result of continued use in our own classes. In addition, each chapter's Study Guide contains a *Chapter Summary* as well as *Study Tips* for the students.

Our third principle has been to avoid an encyclopedic text. It seems that in an effort to please everyone, textbook authors sometimes include bits and pieces of almost everything. The result is that students are often overwhelmed and find it difficult to distinguish the more important material from what is less important.

The fourth principle is to avoid problems of discontinuity that can occur when different groups of authors do separate parts of a total package. To this end, we are the sole authors of the text, the instructor's manual, and the integrated Study Guide. We also carefully supervise the development of the test bank, the Connect Learning Modules, and the PowerPoints. We have tried to ensure that as much care and attention goes into the ancillary materials as goes into the writing of the text.

Few things are more satisfying than witnessing a student's zest for learning. We hope that this textbook adds a little to this process.

Eighth Edition Changes

There are no major organizational changes in this edition. There are however various specific changes in each chapter that are largely a result of feedback provided by our many users and reviewers. The more important changes to the individual chapters are as follows:

- In **Chapter 1**, we rewrote Controversy Two dealing with government income distribution tools. We added a matrix in Section 1.2 to better contrast micro- and macro-economics. We rewrote the material on the introduction to opportunity cost to bring it closer to home for the student. We also rewrote Section 1.6 on the production possibilities curve to achieve more clarity and improved flow. We revised the discussion of Economic Goal 6 (An Equitable Distribution of Income) to recognize the growing income inequality in Canada. We added one new Connect problem.
- In **Chapter 2**, we changed the model product used throughout the chapter to energy bars. We updated a number of products used as examples to appeal to the student demographic. Finally, we added six new Connect problems.

- In **Chapter 3**, we totally revised the income method of calculating GDP, for three reasons. First, we wanted to make this section easier to understand. Second, we wanted to better explain the connection between the income and expenditure methods of measuring national income. Third, we wanted to align with Statistics Canada's latest methodological changes. We revised the section on the problems of economic growth to reflect recent events. We added an additional criticism of GDP figures: it ignores the distribution of income.
- In **Chapter 4**, we modestly expanded the discussion of the decomposition of growth between real changes and price changes. We also added a *Test Your Understanding* question and a Connect problem on this topic. We added an additional paragraph to the content on seasonal unemployment. We added a brief discussion explaining why structural unemployment is difficult to eradicate. We added the point that a lower unemployment rate might signify that the economy is on an upswing. We added a new Connect problem on deflation. We converted the first three graphs concerning employment in Canada from tables, for better illustration.
- In **Chapter 5**, we tried to accommodate the views of reviewers by labelling and referring to the Potential GDP line as the LAS curve. We added two small graphics showing what factors change the AS and what factors change both the AS and the LAS. We introduced the concept of stagflation immediately after the graph showing a decrease in aggregate supply. Finally, we added three new Connect problems.
- In **Chapter 6**, we totally revised the algebraic portion of the full model and eliminated the distinction between the MPC and MPC_D . We contrasted graphically the effect of different-sized MPEs. We gave a more contemporary view of the multiplier using the example of the Sochi Olympics, including a new photo. We changed and simplified the graphic relating to the multiplier process. We revised and simplified the graphic showing "where the money goes." We created a new *Added Dimension* box on the Paradox of Thrift. We added one new Connect problem and four other new problems. Finally, we added a graphic to emphasize the determinants of causes of an increase in income.
- In **Chapter 7**, we included a new *Added Dimension* box on the Types of Taxes. We added the crowding out effect to the section on Shortcomings of Countercyclical Fiscal Policy. We added a discussion of the structural deficit to Section 7.4. We added an algebraic example to illustrate the difference between a structural and cyclical deficit. We inserted a new *Added Dimension* box on provincial debt. We rewrote the *Added Dimension* box titled "Is There a World Financial Crisis?" Finally, we changed our example of a flat rate tax from a poll tax to that of a bridge and highway tolls.
- In **Chapter 8**, after rewriting the section on the history of money, we put it in a specific, stand-alone section. We clarified that the primary source of profits for the banks is interest earned on loans and not service charges. We included a new *Added Dimension* box on the bitcoin. And we added a definition and glossary box on leverage.
- In **Chapter 9**, we included a new *Added Dimension* box on Stephen Poloz. We rewrote the section on the types of money demand. We added a discussion and glossary box on quantitative easing. We added a numerical example of the $MV = PQ$ equation. Finally, we rewrote the *Added Dimension* box on gold.
- In **Chapter 10**, we added a new introductory section with data and graphs illustrating trends in world trade. We added a table highlighting the losers and gainers from the introduction of free trade. A new *Added Dimension* box talks about free versus fair trade. We gave examples of VERs between the U.S., Canada, and Japan. We added four additional Study Guide questions.
- In **Chapter 11**, we provided an explanation of why, for example, a higher interest rate is a disincentive to invest domestically, but an incentive to foreign "investment." We incorporated an *Added Dimension* box on the Dutch Disease. We gave a more detailed explanation of capital versus current accounts. We updated and revised the *Added Dimension* box on the Big Mac Purchasing Power Parity theory. Finally, we added a new Connect graphing problem and a real exchange rate problem.

- In **Chapter 12**, we identified the point when Phillips curve analysis went out of favour and briefly explained why. We both tightened up and expanded the discussion of supply-side economics. We added a new paragraph explaining why a tight money policy is very effective in an open economy. We also added five new Connect problems.
- In **Chapter 13**, we added an introductory paragraph emphasizing the link between world events and economic theory, and vice versa. We rewrote and updated the material on the financial crisis and recession that began in 2008. We added an explanation of quantitative easing. We also added four new Connect problems.

Learning Objectives

At the end of this chapter, you should be able to:

- LO1** Explain the concept of demand.
- LO2** Explain the concept of supply.
- LO3** Explain the term *market*.
- LO4** Explain the concept of (price and quantity) equilibrium.
- LO5** Demonstrate the causes and effects of a change in demand.
- LO6** Demonstrate the causes and effects of a change in supply.
- LO7** Explain why demand and supply determine price and the quantity traded, and not the reverse.

TEXTBOOK FEATURES

As an initial review, and an ongoing resource, the book opens with the **Economics Toolkit**. The first section, *The Canadian Reality*, offers basic information on Canada and its economy. The second section, *Graphing Reality*, provides the student with a primer on how to interpret and create tables and graphs. We have provided a number of features to help the student come to grips with the subject matter.

Learning Objectives, listed at the beginning of each chapter, form a learning framework throughout the text, with each learning objective repeated in the margin at the appropriate place in the main body of the chapter. Each chapter opens with a vignette that provides context and an overview.

Glossary terms indicate the first use of any term that is part of the language of economics. The term itself is in bold print and the definition is provided in the margin. A complete glossary of terms appears at the end of the book.

Test Your Understanding question boxes appear at important points throughout the main body of each chapter. They give students immediate feedback on how well they understand the more abstract concept(s) discussed. In doing this, we have tried to establish what we believe to be a minimum standard of comprehension that all students should strive to achieve. Students can check their own progress by comparing their answers with those in the Student Answer Key, which is available for download at Connect.

Added Dimension boxes identify material that is either general information or supplementary material that we hope adds a little colour to the students' reading.



TEST YOUR UNDERSTANDING

Please see the Answer Key [on Connect] for solutions to these questions.

1. If the economy is in disequilibrium because total income exceeds aggregate expenditure, what must be happening to inventories?
2. Does the term *consumption* refer to spending by households on domestically produced goods and services only? Does the term *investment* include the purchase of stocks and bonds?



ADDED DIMENSION Provincial Debt In Canada

The focus of this chapter has been, until this point, exclusively on the federal government since it is by far the largest government entity in the country—over twice as large as Ontario's and over 30 times the size of Nova Scotia's government. In addition, it is the federal government that has nearly unlimited power to borrow—including its ability to use the central bank as a loan source—and tax.

Nonetheless, the provinces do also tax, spend and borrow. In fact, the combined spending by all of the provinces is actually about 17 percent larger than that of the federal government. How large a debt do the provinces carry? Let's look well at the table here.

B.C.	17%	Quebec	50%
Alberta	No debt	New Brunswick	33%
Saskatchewan	5%	Nova Scotia	35%
Manitoba	27%	P.E.I.	35%
Ontario	38%	Newfoundland	26%

In comparison, the federal government's debt as a percentage of GDP is 34 percent. We see six provinces with similar figures and three that are well below the federal level. However, the 50 percent in Quebec does give one pause.

Highlighted concepts are important ideas that are pulled out and presented in a separate box—signalling to students that this material is particularly relevant and crucial to their understanding.

An increase in price will lead to an increase in the quantity supplied and is illustrated as a movement up the supply curve.

A decrease in price will cause a decrease in the quantity supplied and is illustrated as a movement down the supply curve.

Simple, clear, and uncomplicated **visuals** are found throughout the text. These are supported by captions that thoroughly explain the concepts involved.

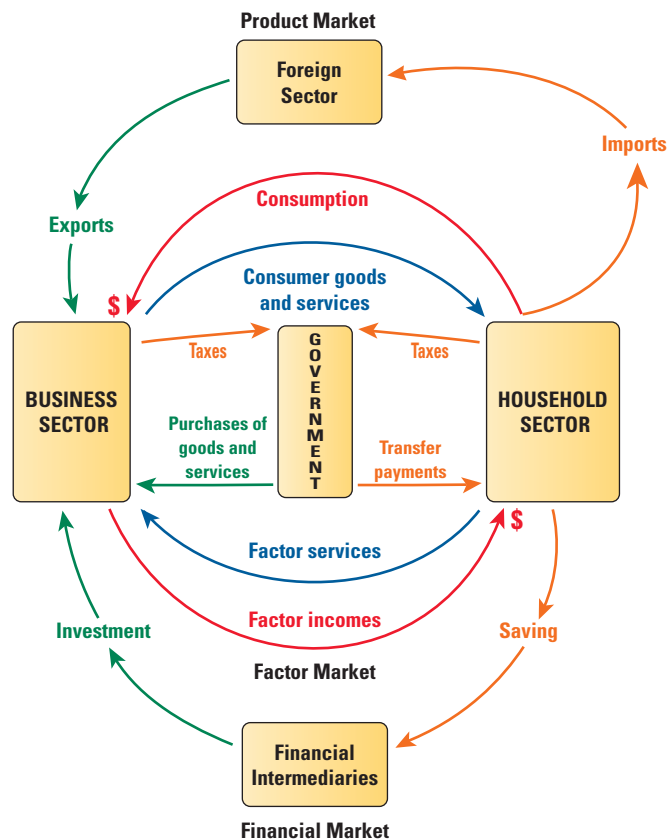
FIGURE 3.4 The Addition of Government

The circular flow of income in the whole economy includes three leakages:

- saving (S)
- import (IM)
- taxes (T)

The circular flow of income also includes three injections:

- investment (I)
- exports (X)
- government spending (G)




INTEGRATED STUDY GUIDE FEATURES

As expressed earlier, we believe that answering questions and doing problems should be an *active part of the students' learning process*. For this reason, we chose to integrate a complete study guide within the covers of this text. A **Study Guide** section, with pages screened in colour, immediately follows each chapter. We were careful to write the questions in the Study Guide to cover all the material, but only the material, found in the text itself. We have chosen a colourful, user-friendly design that we hope will encourage significant student participation.

The Study Guide has been reorganized into two main sections: a *Review* and a set of problems. These include *Connect Study Problems* (with answers available to students and algorithmic versions available to instructors on Connect) and *Problems for Further Study*.

The Review section contains the *Chapter Summary*, *New Glossary Terms*, and *Key Equations*, as well as *Study Tips*, organized by Learning Objective, which are suggestions to help students manage the material in the chapter.



STUDY GUIDE

Review

CHAPTER SUMMARY

In this chapter, you learned that in competitive markets, the price and quantity traded of any product depend on both the demand for and the supply of that product. Once equilibrium is achieved, price and quantity will not change unless either supply or demand changes. In order to fully understand this,

LO5 Demonstrate the causes and effects of a change in demand.

- All products are either normal products or inferior products.
- Market demand *changes* if there is a change in
 - consumers' preferences
 - consumers' incomes

Connect Study Problems

Please see the Answer Key (on Connect) for solutions to the Connect Study Problems. Algorithmic versions of these problems are available to instructors on Connect.

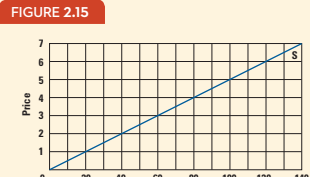
Basic (Problems 1-4)

1. (LO 4)

- Given the data in **Table 2.11**, draw the demand curve in **Figure 2.15**.

Price	Quantity Demanded
1	80
2	70
3	60
4	50
5	40

FIGURE 2.15



The **Connect Study Problems** have been grouped into three learning levels: basic, intermediate, and advanced. Students can judge their progress by working through these problems, and checking their answers with those in the Student Answer Key available for download on Connect. (Each of these problems has algorithmic versions in Connect that instructors can set as labs for their classes.)

Comprehensive Problem

Please see the Answer Key (on Connect) for the solution to the Comprehensive Problem. An alternative version of the Comprehensive Problem is available to instructors on Connect.

(LO 2.3) **Figure 3.5** is the circular flow diagram for the economy of Argos.

- Place the numbers below in the appropriate blanks on the diagram in **Figure 3.5**.

Rent	\$100	Savings	\$100
Wages	400	Government spending	280
Profits	60	Exports	100
Interest	60	Imports	60

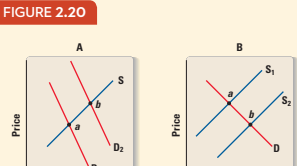
Problems for Further Study

Basic (Problems 1-6)

1. (LO 5) Circle which of the following factors will lead to an increase in the demand for cranberry juice (which is a normal good).

- A decrease in the price of cranberry juice
- A decrease in the price of cranberries
- The expectation by consumers that the price of cranberry juice is likely to increase
- An increase in the price of apple juice
- An increase in consumers' average income
- An improvement in the juicing process that lowers the cost of producing cranberry juice

FIGURE 2.20



In addition, each chapter includes a **Comprehensive Problem** that addresses several key chapter learning objectives (and is available in an alternative form for instructors on Connect), and a set of **Problems for Further Study** (with answers for instructors in the Instructor's Manual).

COMPREHENSIVE TEACHING AND LEARNING PACKAGE

McGraw-Hill Connect™ is a web-based assignment and assessment platform that gives students the means to better connect with their coursework, with their instructors, and with the important concepts that they will need to know for success now and in the future.

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Instructor's Resources

INSTRUCTOR'S MANUAL

There are three parts to each chapter of the Instructor's Manual. First is a brief overview of the chapter, with some rationale for the topics included. Second is a description of how we think the material found in the chapter could be presented. This book's two authors have, between them, taught introduction to macroeconomic principles over two hundred times, and we pass on helpful hints gained from this extensive experience to instructors who may not have been at it so long. More experienced instructors who have found a comfortable groove will simply ignore these suggestions.

The third part contains the answers to the Problems for Further Study in the Study Guide section of the text.



COMPUTERIZED TEST BANK

Prepared by Richard Miles of the British Columbia Institute of Technology, much effort went into writing the Computerized Test Bank in order to ensure that the questions cover all topics in the textbook, but only those topics. The Computerized Test Bank is available through EZ Test Online, a flexible and easy-to-use electronic testing program that allows instructors to create tests from book-specific items. EZ Test accommodates a wide range of question types and allows instructors to add their own questions. Test items are also available in Word (Rich Text Format). For secure online testing, exams created in EZ Test can be exported to WebCT and Blackboard. EZ Test Online is supported at www.mhhe.com/eztest where users can download a Quick Start Guide, access FAQs, or log a ticket for help with specific issues.

POWERPOINT® PRESENTATIONS


Prepared by Stephen Mullins of St. Clair College, this package includes dynamic slides of the important illustrations in the textbook, along with detailed, chapter-by-chapter reviews of the important ideas presented in the text.

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In the end, of course, any errors or confusion that remain are our responsibility.

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ECONOMICS TOOLKIT

Some students take economics because it is a requirement for a program they have chosen or degree that they are working toward. Some are interested in a career in business, and taking economics seems like a natural choice. Some even take it because they think that they might like it. Whatever your reasons for taking economics, we are glad you did and hope you will not be disappointed. Economics is a challenging discipline to learn, but it is also one of the most rewarding courses you will ever take. The logic and analysis used in economics is very powerful, and successfully working your way through the principles of economics over the next term will do for your mind what a serious jogging program will do for your body. Bon voyage!

THE CANADIAN REALITY

The Land

Canada is a huge country—in fact, it is the second-largest country on this planet. It contains seven percent of the world's land mass. It stretches 5600 kilometres from the Atlantic to the Pacific Ocean and encompasses six time zones. Ontario alone, which is the second-largest province (after Quebec), is larger than Pakistan, Turkey, Chile, France, or the United Kingdom. Canada's ten provinces range in size from tiny Prince Edward Island to Quebec, which is nearly 240 times as large. In addition, its three territories—the Northwest Territories, Yukon, and Nunavut—demand that we describe this country's reach as being from sea to sea *to sea*.

Within Canada, there are at least six major mountain ranges: the Torngats, Appalachians, and Laurentians in the east, and the Mackenzie, Rocky, and Coast ranges in the west. Any one of these rivals the European Alps in size and grandeur. In addition, Canada has vast quantities of fresh water—9 percent of the world's total—in tens of thousands of lakes and numerous rivers, of which the St. Lawrence and the Mackenzie are the largest.

Canada is richly endowed with natural resources, including gas, oil, gold, silver, copper, iron, nickel, potash, uranium, zinc, fish, timber, and, as mentioned above, water—lots of fresh water. The conclusion is inescapable: Canada is a big, beautiful, and rich country.

The People

The word *Canada* comes from a Huron-Iroquois word meaning *village*. In a sense, this is very appropriate because, big as the nation is geographically, it is small in terms of population. Its over 34 million people make up only 0.5 percent of the world's population. In fact, there are more people in California or in greater Tokyo than there are in the whole of Canada. Interestingly, Canada's annual population growth rate, at 1.2 percent, is the highest among G8 countries, primarily because of Canada's high rate of immigration. Thirty-nine percent of Canadians live in the province of Ontario and 23 percent in Quebec. On the other hand,

Prince Edward Island has a population of only 141 000, less than that of the cities of Sherbrooke, Quebec, or North Vancouver, B.C.

Despite the popular images of small Maritime fishing villages, lonely Prairie grain farmers, or remote B.C. loggers, Canada is, in fact, an urban nation. Over 80 percent of Canadians live in what Statistics Canada calls “urban” areas. There are six Canadian metropolitan areas with populations of over 1 million: Toronto, with 5.6 million; Montreal, 3.8 million; Vancouver, 2.3 million; Calgary and Edmonton, each with 1.2 million, and Ottawa–Gatineau, 1.2 million. It is also true that the vast majority of the nearly 35 million Canadians live in a narrow band stretching along the border with the United States, which, incidentally, is the longest unguarded border in the world.

Approximately half of the Canadian population is active in the labour force. The labour-force participation rate in 2012 was 71 percent for males and 62 percent for females.

Multiculturalism

Within this vast, thinly populated country there is a truly diverse, multicultural mix of people. This reality was officially recognized in 1988 when Parliament passed the *Multiculturalism Act*.

There are two official languages in Canada, yet 18 percent of Canadians speak a language other than English or French. In fact, at least 60 languages are spoken in this country. In each year of the 2000s, more than 200 000 new immigrants arrived in Canada. Over 18 percent of the entire population are first-generation Canadians. In both Toronto and Vancouver, over half the students in the public school system are from non-English-speaking homes. There are over 100 minority language publications in Toronto, and Vancouver has three daily Chinese-language newspapers.

Canada’s First Nations people number 1.1 million (3.8 percent of the total population), and a quarter of them live in Ontario.

Government

Canada is a constitutional monarchy with a democratic parliament made up of the House of Commons, with 308 elected members, and the Senate, with 105 appointed members. In addition to Parliament, the other two decision-making divisions of the federal government are the Cabinet, composed of the prime minister and 25 (or so) ministers and their departments, and the judiciary, which includes the Supreme Court as well as the federal and tax courts.

Just as there are two official languages in this country, Canada has two systems of civil law—one uncoded and based on common law in English Canada, and the other a codified civil law in Quebec. Canada’s current constitution, the first part of which is the *Canadian Charter of Rights and Freedoms*, came into being in 1982, a full 115 years after Confederation created the country in 1867.

The fact that Canada is a confederation means the federal government shares responsibilities with the provinces. For example, while the federal government has jurisdiction in national defence, international trade, immigration, banking, criminal law, fisheries, transportation, and communications, the provinces have responsibility for education, property rights, health, and natural resources. Inevitably, issues arise from time to time that do not fit neatly into any one of these categories, with the result that federal–provincial disputes are a continuous part of the Canadian reality.

Canada the Good

Most Canadians are well aware that they live in a good country. But perhaps many do not realize just how good. The average family after-tax income is currently over \$74 000, which puts the Canadian living standard among the highest in the world.

The United Nations maintains a Human Development Index that considers factors in addition to average income levels, including life spans and literacy rates. In 2011, this index ranked Canada as the number five nation in the world in which to live. One reason for this high ranking is that Canadian governments spend over 10 percent of the country's gross domestic product (GDP) on health care.

More than 70 percent of Canadians own their homes, well over 90 percent are literate, and over 80 percent of all Canadians have access to the Internet. All three of these statistics are among the highest in the world.

Canada the Odd

Canada is a good country in which to live; however, it does have its oddities. In 1965–98 years after Confederation—it was decided that Canada really should have a national flag. A parliamentary selection committee was set up to choose one, and received no less than two thousand designs. The flag debate was acrimonious, to say the least, although today most Canadians seem quite comfortable with the Maple Leaf. The English-language lyrics of Canada's national anthem, *O Canada*, were formally approved only in 1975. Canada adopted the metric system of measurement in the 1970s, but the imperial system is still in wide use; for example, Statistics Canada still reports the breadth of this country in miles, we sell sizes of wood in inches (such as 2×4 s), and football fields are 110 yards long.

In this bilingual country, it is odd to note that there are more Manitobans who speak Cree than British Columbians who speak French. In this affluent country of ours, it is also interesting to note that 4 percent of Canadian homes are heated exclusively by burning wood. Canada's official animal is—the beaver.

On a more serious note, it is a sad fact that the trade of many goods, and even some services, between any one province and the United States is freer than trade between provinces. There is an interesting history concerning trade patterns in North America. At the time of Confederation, trade patterns on this continent were mostly north–south. The Maritimes traded with the New England states, Quebec with New York, Ontario with the Great Lakes states to its south, and the West Coast traded with California. Canada's first prime minister, John A. Macdonald, was also elected as its third. During his second administration, he implemented his party's National Policy, which resulted in (1) the building of a railway to the West Coast, which encouraged British Columbia to join Canada; (2) offering free land to new immigrants on the prairies in order to settle this area; and (3) forcing trade patterns into an east–west mode by erecting a tariff wall against American imports. British Columbia did join Confederation; people were enticed to settle in Manitoba, Saskatchewan, and Alberta; and the pattern of trade did become more east–west.

So was the National Policy a success? Some would argue yes, pointing out that it built a nation and that Canada as we know it might not exist today without it. Others are not so sure and would argue that it set back Canada's development by encouraging and protecting new, less efficient industries through the creation of a branch-plant economy. This occurred because American firms that had previously exported to Canada simply jumped over the tariff walls and established Canadian branch plants. Some believe that the National Policy also promoted Canadian regionalism and aggravated relations between regions because both the West and the Maritimes felt that most of its economic benefits favoured central Canada.

In any case, as a result of the North American Free Trade Agreement (NAFTA) of 1992, trade with the United States (and Mexico) is now mostly without tariffs and north–south trade patterns are re-emerging. Historically, Canadian policy has come full circle. However, the trade barriers between provinces, which were built piece by piece over a century, remain.

The Economy

Canada is among the ten largest economies in the world, despite its small population. In 2012, Canada's GDP was \$1820 billion. This figure can be broken down as illustrated in [Table T.1](#).

TABLE T.1

Category	Amount (\$billion)
Personal expenditures	1012
Investment spending	372
Government spending	472
Exports	547
Less imports	(583)
Total GDP	1820

Source: Adapted by the authors from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Table 380-0064, January 9, 2014.

The provincial breakdown of the 2012 GDP figure of \$1820 billion is shown in [Table T.2](#).

TABLE T.2

Province	Population (million)	GDP (\$billion)	GDP per Capita (\$thousand)
Newfoundland (and Labrador)	0.53	33.8	64.2
Prince Edward Island	0.15	5.5	38.2
Nova Scotia	0.95	38.4	40.6
New Brunswick	0.76	31.6	41.7
Quebec	8.1	357.9	44.3
Ontario	13.4	674.5	50.3
Manitoba	1.3	58.2	46.6
Saskatchewan	1.1	78.0	71.7
Alberta	3.9	311.9	80.2
British Columbia	4.5	220.0	48.4
Yukon	0.4	2.6	72.6
Northwest Territories (pre-Nunavut)	/	4.7	/
Nunavut	0.3	1.0	50.4

Source: Adapted by the authors from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Tables 384-0038 and 051-0001, January 9, 2014.

This table illustrates the wide disparity in GDP per capita between provinces, from a low of \$38 200 per person in Prince Edward Island to a high of \$80 000 in Alberta.

In most years the economy grows and the GDP figure rises. To accurately compare growth in GDP, however, we need to use a common set of prices so that a simple rise in prices is not confused with an actual increase in the output of goods and services. Using *real* GDP figures, which correct for inflation, accomplishes this. [Table T.3](#) looks at some recent real GDP figures, using 2007 prices.

TABLE T.3

Year	Real GDP (\$billion)	Increase/Decrease (\$billion)	% Increase
2008	1584	—	—
2009	1541	−43	−2.7
2010	1593	+52	+3.4
2011	1634	+41	+2.6
2012	1662	+28	+1.5

Source: Adapted by the authors from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Table 380-0064, January 9, 2014.

Next, let us look at a breakdown of Canada's GDP by industry in **Table T.4**, presented in order of importance.

TABLE T.4

Industry	Percentage of GDP
Finance	19.1
Trade (wholesale and retail)	10.9
Manufacturing	10.8
Professional and technical	8.6
Mining/oil	8.0
Construction	7.2
Public administration	7.0
Health	6.9
Education	5.3
Transportation	4.2
Information and cultural	3.4
Utilities	2.5
Accommodation and food	2.0
Other services	1.8
Agriculture, fishing, and forestry	1.6
Arts and entertainment	0.7

Source: Adapted from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Table 379-0031, January 9, 2014.

This information is helpful in many ways. For example, it is certainly time to put to rest the idea that Canada is a resource-based economy and that Canadians are simply “hewers of wood and drawers of water,” as many of us were taught in school. In fact, agriculture/fishing/forestry and mining/oil make up less than 10 percent of our economy's GDP. Only 4 percent of working Canadians are employed in primary industries, down dramatically from 13 percent a quarter of a century ago.

In contrast, one can marshal the argument that Canada is quite a sophisticated and technologically advanced economy. For example, it is not generally recognized that Canada was the world's third nation to go into space, with the *Alouette I* satellite in 1962. Canadian

industries pioneered long-distance pipeline technology, and Canada is a world leader in several areas of aviation, including turboprop, turboprop, and firefighting aircraft, not to mention the well-known Canadarm used on space shuttles. Canada is also a world leader in commercial submarine technology, and routinely maintains one of the world's longest and most efficient railway systems.

One can also point to many outstanding Canadian companies that are truly world leaders in technology and performance, including Bombardier in transportation equipment, Ballard Power in fuel cell technology, SNC Lavalin in aluminum plant design, Rio Tinto in mining, Trizec Hahn in real estate development, and Magna International in automobile parts manufacturing.

Exports: The Engine That Drives the Economy

Exports are a fundamental part of the Canadian economy. Almost 40 percent of its GDP is exported, which makes Canada one of the world's greatest trading nations. Exports to the United States alone directly support over 1.5 million Canadian jobs, and a \$1 billion increase in exports translates into 11 000 new jobs. Again, contrary to historical wisdom, only 25 percent of Canadian exports are resources—the figure was 40 percent a quarter of a century ago.

Table T.5 breaks down the \$547 billion worth of goods and services Canada exported in 2012 into nine categories in order of size.

TABLE T.5

Export Category	Percentage of Total Exports
Industrial goods	19.4
Energy products	19.2
Services	15.4
Automotive products	12.5
Machinery and equipment	12.3
Consumer goods	8.9
Forestry products	5.6
Agricultural and fishing products	5.0
Others	1.8

Source: Adapted from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Tables 228-0059, January 11, 2011.

A Mixed Economy

At the start of the twenty-first century, the market system dominates most of the world's economies, and Canada is no exception to this. Yet government also plays a big role in our economy. For example, in 2009 the three levels of government collected \$586 billion in tax revenue, which represented over 38 percent of Canada's 2009 GDP. **Table T.6** shows the sources and the uses of this revenue.

The largest single source of the government's tax revenue, 32 percent, was personal income taxes. Consumption taxes include, most significantly, the GST (goods and services tax) and the PST (provincial sales tax) as well as gasoline, alcohol, and tobacco taxes, customs taxes, and gaming income. These indirect (consumption) taxes accounted for 18 percent of total revenue. Thus, we can see that the majority of the government's tax revenue comes from individual Canadians in the form of direct income taxes or consumption taxes.

And how does government spend these billions of dollars of tax revenue? The right column of **Table T.6** shows us.

TABLE T.6

Government Revenues	% of Total	Government Expenditures	% of Total
Personal income taxes	32.3	Social services	25.6
Consumption taxes	18.3	Health	20.5
Property taxes	9.4	Education	16.1
Investment income	9.2	Protection of persons and property	8.5
Sales of goods and services	9.2	Debt charges	7.6
Corporate incomes taxes	8.5	Environment	6.3
Social security premiums	6.0	Transportation	5.4
Other taxes	5.3	Government services	3.8

Source: Adapted by the authors from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Table 385-0001, January 12, 2011.

Here, we see that government's largest single category of spending, 26 percent, was on social service payments to individuals. The lion's share of this expenditure (approximately two-thirds) was social services (pensions, unemployment benefits, and welfare) payments. Thus, we see that a large percentage of spending by government is an attempt to direct income to poorer Canadians. Since all Canadians pay for most of these expenditures, we can see that government is actively involved in *transferring* income from higher-income to lower-income families and individuals. This income distribution role is seen by many Canadians as an important function of government.

On the other hand, some Canadians take the view that government has gone too far in its interventionist role and yearn for less governmental involvement in the economy. They often point to the United States as an example of an economy in which welfare, unemployment, and pension payments to individuals and direct government aid to poor regions of the country are lower. The difference in the general approach of the two governments may well lie in historical differences in the attitudes of Canadians and Americans toward government. Over the years, Canadians, by and large, have trusted governments to act in their best interests and have been more tolerant of government attempts at income redistribution. Americans, on the other hand, have a history of being suspicious of big government and have repeatedly rejected attempts to expand its role. The recent controversy in the United States over attempts to implement a national health care policy is an example. Another is the Canadian government's direct aid to cultural endeavours, including the funding of national television and radio networks, while no such efforts exist in the United States.

The next two largest categories of spending are on two essentials, health and education. In 2009, the Canadian government allocated 21 and 16 percent of spending in these two areas. The fourth category, protection of persons and property, includes expenditures on the military, police, fire departments, court system, and prisons. Interest on the national debt was the fifth-biggest item of spending at just under 8 percent. The amount spent in this area has steadily declined in the last few years as Canada has started to get government budget deficits under control. (As recently as 1998, servicing the national debt amounted to as much as 30 percent of total spending.) The other categories include a host of such items as culture (the Canada Council), housing, foreign affairs, immigration, labour, and research.

This completes our brief look at the Canadian economic reality. We hope that it has helped fill in some gaps in your knowledge of the country. We are confident that you will come to know your country much better after a thorough grounding in the principles of economics, for, in a very real sense, economics is about understanding and improving on what we already know.

GRAPHING REALITY

Let us face it, a lot of students hate graphs. For them a picture is not worth a thousand words. It may even be true that they seem to understand some economic concepts just fine until the instructor draws a graph on the board. All of a sudden, they lose confidence and start to question what they previously thought they knew. For these students, graphs are not the solution but the problem. This section is designed to help those students overcome this difficulty. For those other, more fortunate, students who can handle graphs and know that they are used to illustrate concepts, a quick reading of this section will help reinforce their understanding.

It is probably true that if an idea can be expressed clearly and precisely with words, then graphs become an unnecessary luxury. The trouble is that, from time to time, economists find themselves at a loss for words and see no way of getting a certain point across except with the use of a graph. On the other hand, by themselves, graphs cannot explain everything; they need to be accompanied by a verbal explanation. In other words, graphs are not a substitute for words but a complement. The words accompanied by a picture can often give us a much richer understanding of economic concepts and happenings.

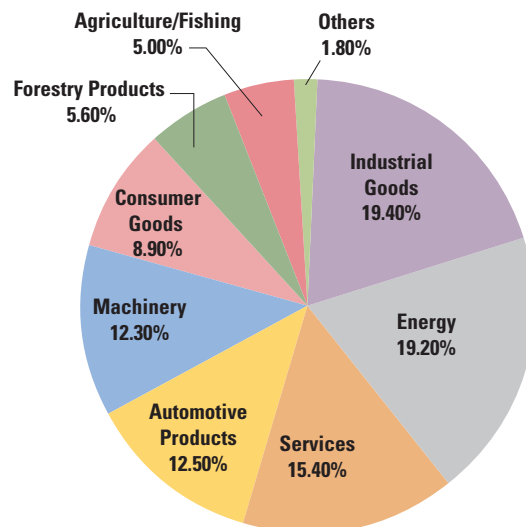
Graphing a Single Variable

The graphing of a single variable is reasonably straightforward. Often, economists want to concentrate on a single economic variable, such as Canada's exports, or consumers' incomes, or the production of wine in Canada. In some cases, they want to look at the composition of that variable, say, different categories of exports. In other cases, they are interested in seeing how one variable changed over a period of time, such as total exports for each of the years 2005 through 2009. In the first instance, we would be looking at a cross-section; in the second instance, we are looking at a time series.

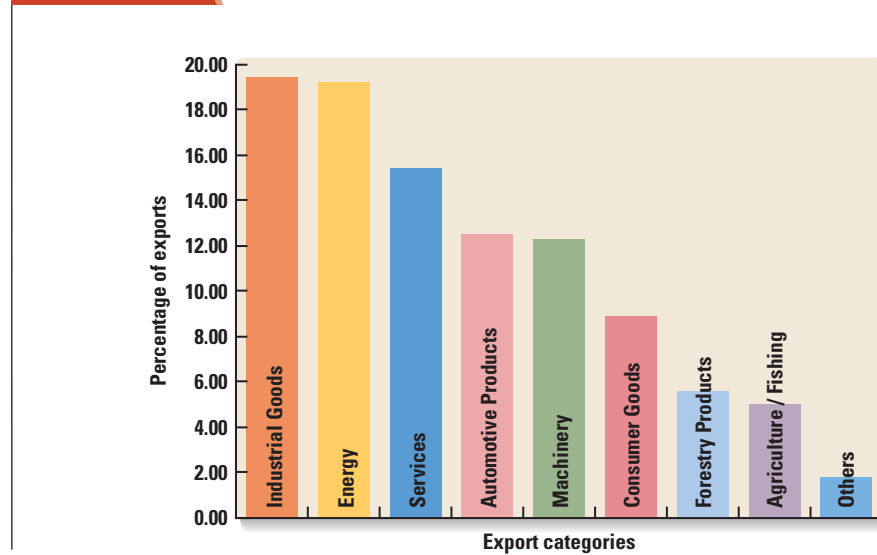
Cross-Sectional Graphs

One popular way of showing cross-sectional data is in the form of a pie chart. **Figure T.1**, for instance, shows the composition of Canada's exports for 2012 in terms of the type of

FIGURE T.1 Composition of Canadian Exports, 2012



Source: Adapted from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Tables 228-0059, January 9, 2014.

FIGURE T.2 Composition of Canadian Exports, 2012

Source: Adapted from the Statistics Canada CANSIM database, <http://cansim2.statcan.ca>, Tables 228-0059, January 11, 2011.

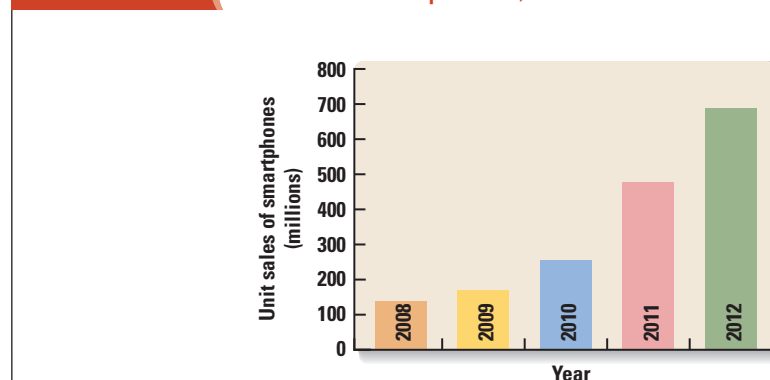
goods or services that Canada sells abroad. (This is the same data as presented in [Table T.5](#). Which presentation format—table or graph—do you prefer? Which do you find easier to read and understand?)

The size of each slice indicates the relative size of each category of exports. But the picture by itself is not always enough. We have added the percentage of total exports that each type represents. Note, however, that there are no dollar amounts for the categories.

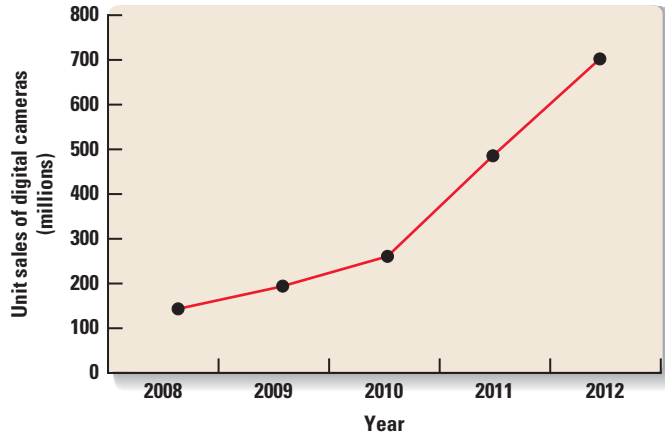
Alternatively, the same information could be presented in the form of a bar graph, as in [Figure T.2](#). Unlike the pie chart, the bar graph allows us to more easily compare the relative sizes of each category since they are now placed side by side.

Time-Series Graphs

Time-series data can also be presented in the form of a bar graph. [Figure T.3](#) is a bar graph showing the rapid growth in the worldwide sales of smartphones over the past five years.

FIGURE T.3 Sales of Smartphones, 2008-2012

Source: Adapted from Gartner.com, retrieved January 10, 2014.

FIGURE T.4 Ownership of Digital Cameras, 2008–2012

Source: Adapted from Gartner.com, retrieved January 10, 2014.

The same information can be presented in a line graph, as is done in **Figure T.4**. Note that in both cases, the years (time) are shown on the horizontal axis; early years are on the left and later years on the right. This is because graphs are always read from left to right.

Graphing Two Variables

Things get a little trickier when we want to deal with two variables at the same time. For instance, suppose we want to relate Canada's disposable income, which is the total take-home pay of all Canadians, and the amount spent on consumer goods (these numbers are in billions and are hypothetical). One obvious way to do this is with a table, as is done in **Table T.7**.

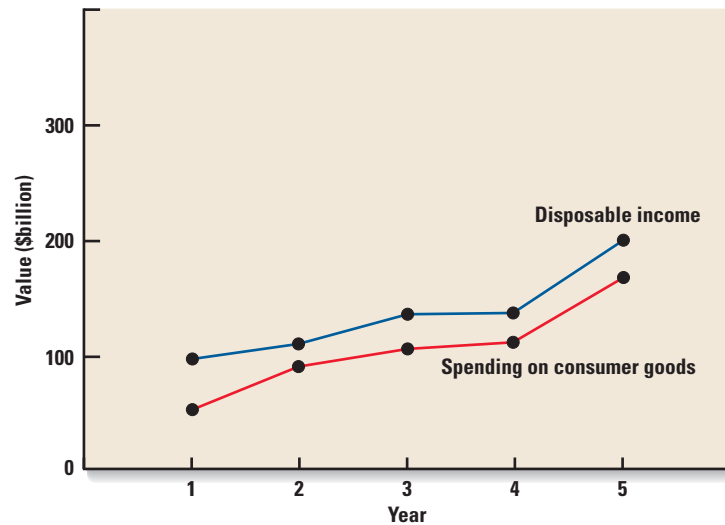
TABLE T.7

Year	Disposable Income	Spending on Consumer Goods
1	\$100	\$ 80
2	120	98
3	150	125
4	160	134
5	200	170

A time-series graph, using the same data, is presented in **Figure T.5**. You can see that the two lines in **Figure T.5** seem to be closely related, and that is useful information. To more clearly bring out the relationship, we could plot them against each other. But if you look again at **Table T.7**, you will see that there are really three different variables involved: the time (five years), the values of disposable income, and the values of spending. However, it is very difficult to plot three variables, all three against each other, on a two-dimensional sheet of paper.

FIGURE T.5

Disposable Income and Spending on Consumer Goods
(hypothetical numbers)

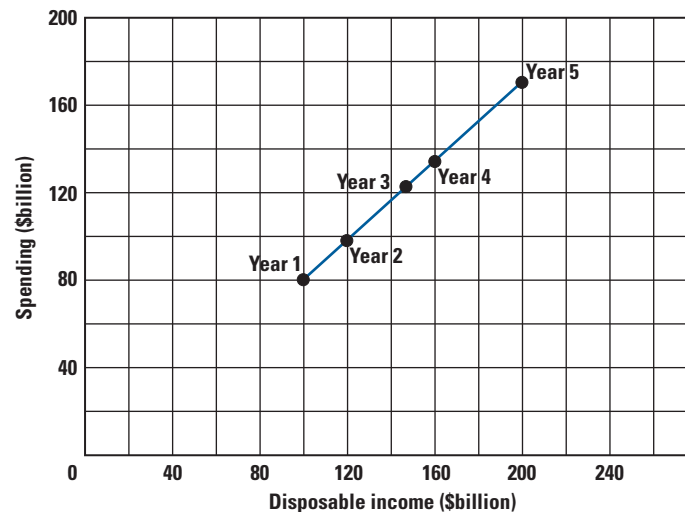


Instead, in **Figure T.6**, we will put disposable income on the horizontal axis (also called the x-axis), and consumer spending on the vertical axis (also called the y-axis) and indicate time with written notation. There is a rule about which variable goes on which axis, but we will leave that for later chapters.

Next, we need to decide on a scale for each of the two axes. There is no particular rule about doing this, but just a little experience will enable you to develop good judgment about selecting these values. We have chosen to give each square on the axes the value of \$20. This can be seen in **Figure T.6**.

FIGURE T.6

Spending on Consumer Goods



We started plotting our line using year 1 data. In that year, disposable income was \$100 and consumer spending was \$80. Starting at the origin (where the vertical and horizontal axes meet), which has an assigned value of zero, we move five squares to the right. Now, from this income of \$100, we move up vertically four squares, arriving at a value of \$80 for consumer spending. This is our first plot (or point). We do the same for year 2. First, we find a value of \$120 on the horizontal (disposable income) axis and a value of \$98 (just less than five squares) on the vertical axis. The place where these two meet gives us our second point to plot. We do the same for the three next years, and join up the five points with a line. Note that the relationship between income levels and consumer spending plots as a straight line.

Direct and Inverse Relationships

Next, if you look back at [Table T.7](#), you will see that disposable income and consumer spending rise together over time. When two variables move together in this way, we say that there is a *direct* relationship between them. Such a direct relationship appears as an upward-sloping line. On the other hand, when two variables move in opposite directions so that one variable increases as the other variable decreases, we say there is an *inverse* relationship between them. In that case, plotting the two variables together would result in a downward-sloping line. (When we talk about upward-sloping and downward-sloping, remember that we are reading the graphs from left to right.)

One last point: the income-consumer spending line in [Figure T.6](#) is a straight line. There is no reason that this has to always be the case. Some data might plot as a straight line, and other data might be nonlinear when plotted (as in [Figure T.5](#)). Either, of course, could still be downward or upward sloping.

Measuring the Slope of a Straight Line

As you proceed with this course, you will find that you need to go a bit further than merely being able to plot a curve—in economics, by the way, all lines are described as curves, whether they are linear or nonlinear. You will also need to know just how steep or how shallow the line is that you have plotted. In other words, you will need to measure the slope of the curve. What the slope shows, in effect, is how much one variable changes in relation to the other variable as we move along a curve. In graphic terms, this means measuring the change in the variable shown on the vertical axis (known as the *rise*), divided by the change in the variable shown on the horizontal axis (known as the *run*). The rise and the run are illustrated, using our disposable income/consumer-spending example, in [Figure T.7](#).

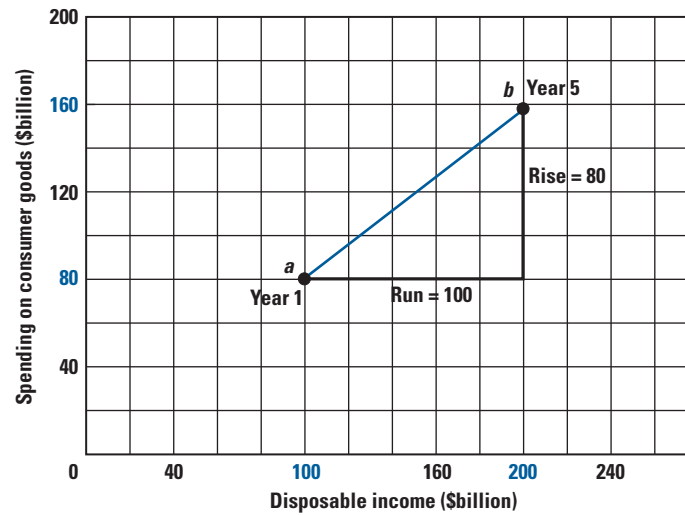
Note that as we move from point *a* to point *b*, consumer spending increases by 80 (from 80 to 160). This is the amount of the rise. Looking along the horizontal axis, we see that disposable income increases by 100 (from 100 to 200). This is the amount of the run. In general, we can say

$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in the value on the vertical axis}}{\text{change in the value on the horizontal axis}}$$

Specifically, the slope of our line is therefore equal to

$$\frac{+80}{+100} = +0.8$$

[Figure T.8](#) shows four other curves, two upward sloping and two downward sloping, with an indication for each as to how to calculate the various slopes. In each case, we measure the slope by moving from point *a* to point *b*.

FIGURE T.7 Rise over Run


The Slopes of Curves

If a line is straight, it does not matter where on the line we choose to measure its slope; the slope is constant throughout its length. But this is not true of a curve. The slope of a curve will have different values at every point along its length. However, it is possible to measure the slope at any point by drawing a straight line that touches the curve at that point. Such a

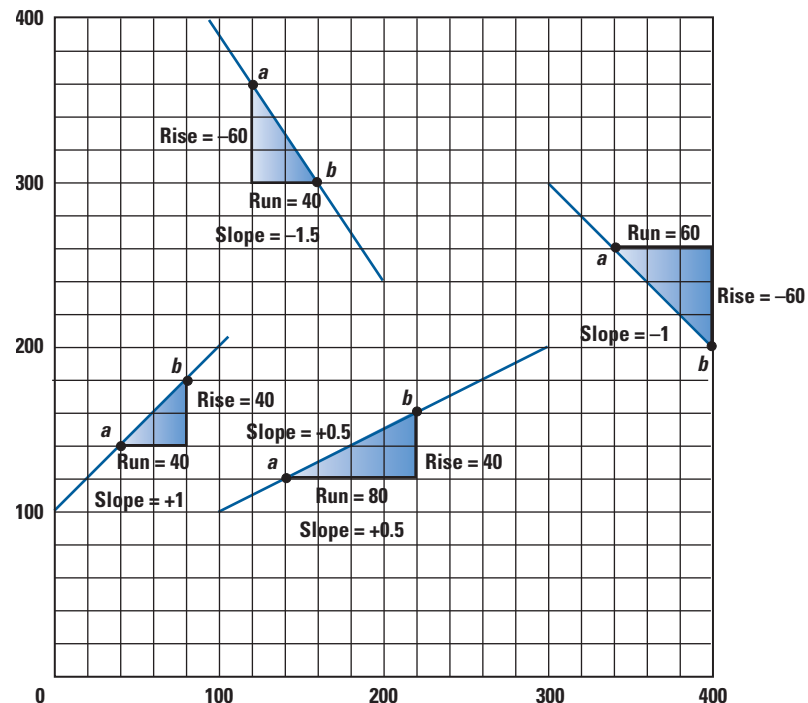
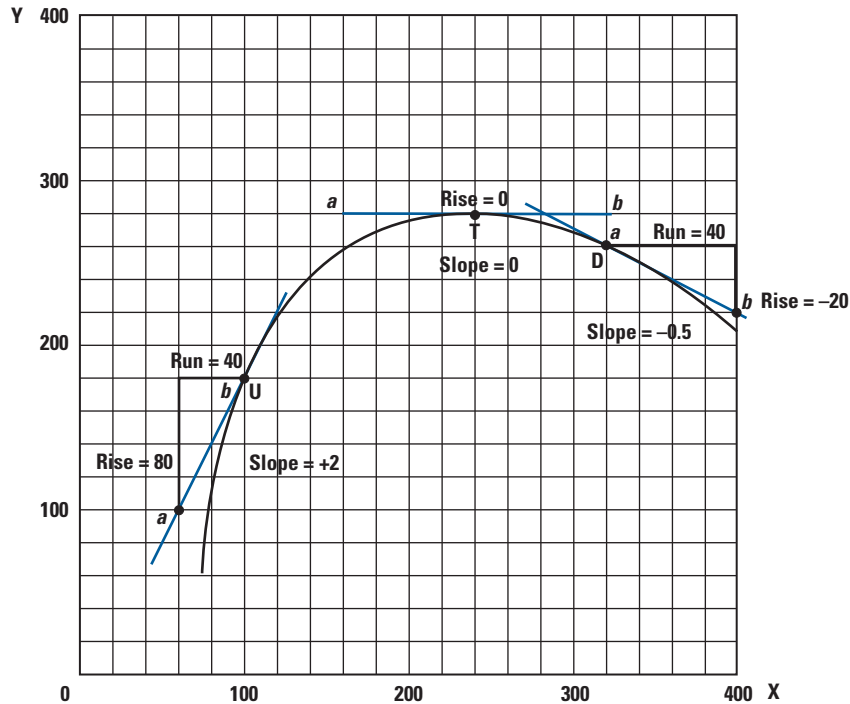
FIGURE T.8 Four Different Slopes


FIGURE T.9 The Slope of a Curve


line is called a *tangent to the curve*. **Figure T.9**, for instance, shows a curve that, at various points, has a positive slope (the upward-sloping portion), a zero slope (the top of the curve), and a negative slope (the downward-sloping portion). We have drawn in three tangents at different positions along the curve. From these straight-line tangents we can calculate the value of the slope at each of these points.

At point U, for example, the curve rises quite steeply. So what is its slope? Well, its slope at this point is the same as the value of the slope of the straight-line tangent. As we already know the slope of a straight line is

$$\frac{\text{Rise}}{\text{Run}}$$

At point U, this is equal to

$$\frac{+80}{+40} = +2$$

This is also the value of the slope of the curve at point U.

At point T, the tangent is a horizontal line, which, by definition, does not rise or fall. The rise/run at this point, therefore, is equal to zero. Finally, at point D, both the curve and the tangent are downward sloping, indicating a negative slope. Its value is calculated, as before, as rise/run, which equals $-20/40$ or -0.5 .

Equations for a Straight Line

In economics, graphs are a very important and useful way to present information. Thus, you will find the pages of most economics books liberally sprinkled with graphs. But there are

other, equally useful, ways of presenting the same data. One of these is an algebraic equation. You will often find it very useful to be able to translate a graph into algebra. In this short section, we will show you how to do this. To keep things simple, we will restrict our attention to straight-line graphs.

In order to find the equation for any straight line, you need only two pieces of information: the slope of the line and the value of the Y-intercept. You already know how to calculate the value of the slope. The value of the Y-intercept is simply the value at which the line crosses the vertical axis. In general, the algebraic expression for a straight line is given as

$$Y = \alpha + \beta X$$

The value of Y where the line crosses the Y-axis
+ Upward sloping
- Downward sloping
The value of the slope

For instance, in **Figure T.10**, line 1 has a slope of +1 (the line is upward-sloping and therefore has a positive slope and rises by 10 units for every run of 10 units). The line crosses the Y-axis at a value of 50. The equation for line 1, therefore, is

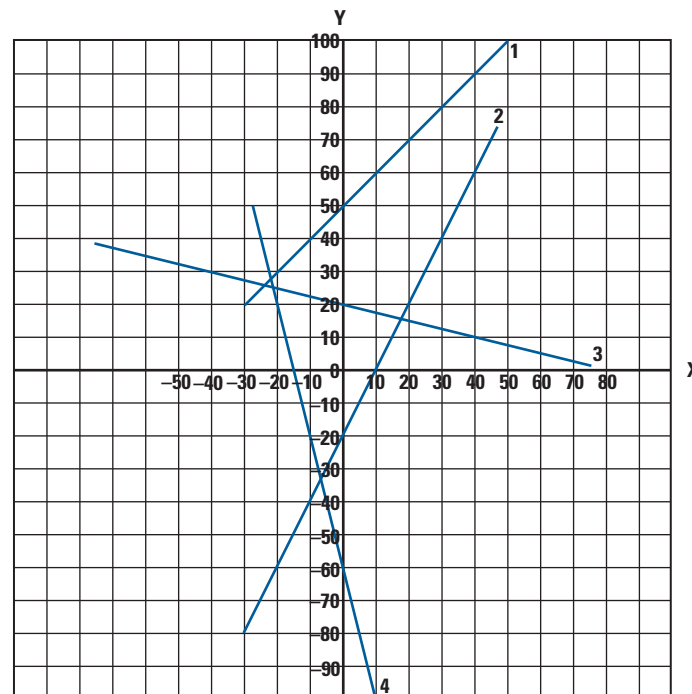
$$Y = 50 + (1)X$$

Armed with this equation, we could figure out the value of Y for any value of X. For example, when X (along the horizontal axis) has a value of 40, Y must be equal to

$$Y = 50 + 40 = 90$$

You can verify this in **Figure T.10**. In addition, we can work out values of X and Y that are not shown on the graph. For example, when X equals 200, Y equals $50 + 200 = 250$.

FIGURE T.10 Equations for Straight Lines



Let us work out the equations for the other lines shown in **Figure T.10**. Line 2 is also upward sloping, but it is steeper than line 1 and has a slope of +2 (it rises by 20 for every run of 10).

Its intercept, however, is in the negative area of the y-axis and crosses at the value of -20 . The equation for line 2, then, is

$$Y = -20 + 2X$$

Again, you can check that this is correct by putting in a value for X , finding the corresponding value of Y , and looking on the graph to see if it is correct. For instance, when X has a value of 40, the equation tells us that

$$Y = -20 + 2(40) = 60$$

You can confirm in **Figure T.10** that this is indeed the case.

In contrast, line 3 has a negative slope of 0.25 and a Y-intercept at 20. Its equation, therefore, is

$$Y = 20 - 0.25X$$

Finally, line 4 has the equation

$$Y = -60 - 4X$$

Finding the Intersection Between Two Curves

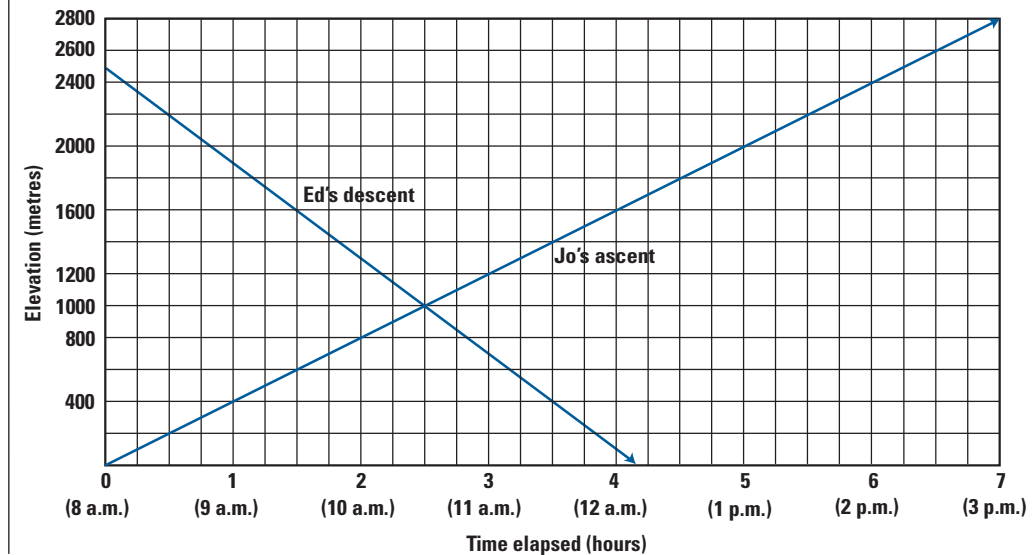
A good deal of economics is concerned with investigating two variables that are related to a common factor. As we shall see in Chapter 2, the quantities of a product that consumers want to buy and the amount that producers wish to sell (demand and supply) are both related to the price of that product. Similarly, the number of employees who are willing to work and the number of people employers are willing to hire are both related to the wage that is offered. You will, therefore, often need to be able to graph two sets of data and find where they coincide. Let us illustrate the process with a non-economics example. Suppose one early morning Jo is sitting at the bottom of a 2500 metre mountain. At the same time, Ed is sitting at the top of the same mountain. Assuming that they start off at the same time (say 8 a.m.) with Jo climbing up at a rate of 400 metres per hour and Ed climbing down at 600 metres per hour, let us see if we can work out where on the mountain and at what time they will meet.

First, we need to transfer this data into a table showing where each individual climber will be at what time. This information is shown in **Table T.8**.

TABLE T.8

Jo's Ascent			Ed's Descent		
Elapsed/Time	Elevation (metres)		Elapsed/Time	Elevation (metres)	
0	(8 a.m.)	0	0	(8 a.m.)	2500
1	(9 a.m.)	400	1	(9 a.m.)	1900
2	(10 a.m.)	800	2	(10 a.m.)	1300
3	(11 a.m.)	1200	3	(11 a.m.)	700
4	(12 noon)	1600	4	(12 noon)	100
5	(1 p.m.)	2000	4:10	(12:10 p.m.)	0
6	(2 p.m.)	2400			
6:15	(2:15 p.m.)	2500			

FIGURE T.11



We can also show their ascent and descent graphically. In **Figure T.11**, we will use the vertical axis to show the elevation and the horizontal axis to show the time elapsed.

According to the graph, it seems that they will meet after exactly 2½ hours, that is, at 10:30 a.m. at an elevation of 1000 metres.

We can confirm this result if we translate these data into an algebraic expression. Let us look at Jo's ascent. Her elevation depends on how fast she climbs and how long she climbs. We know she starts at the bottom of the mountain (elevation zero) and climbs at a rate of 400 metres per hour. If we let the elevation equal Y and the time elapsed equal X , then her ascent can be shown as

$$\text{Jo's elevation:} \quad Y = 0 + 400X$$

In contrast, Ed starts at an elevation of 2500 metres and his elevation falls as he climbs down. His descent can, therefore, be shown as

$$\text{Ed's elevation:} \quad Y = 2500 - 600X$$

To find out when and where they will meet is to recognize that whatever this point is, it occurs on the mountain at the same point for the two of them. In other words, Jo and Ed's elevation will be the same. Algebraically, we make the two equations equal and solve. Thus

$$400X = 2500 - 600X$$

$$1000X = 2500$$

$$X = 2.5$$

So they will meet after 2.5 hours (2 hours and 30 minutes), or at 10:30 a.m. To find out where they will meet, simply replace X with 2.5 in Jo's and/or Ed's elevation equation.

$$\text{Jo:} \quad 400(2.5) = 1000 \text{ (metres)}$$

$$\text{Ed:} \quad 2400 - 600(2.5) = 1000$$

Graphs and Logic

Now let us look at some potential problems in illustrating data with graphs. For example, the relationship between income and consumer spending in [Table T.7](#) is hypothetical, since we created it so that it would plot well on a graph. However, any real-world relationship between two variables may not be as neat and simple as this. Data does not always plot into a nice straight line.

Even more seriously, we can never be totally certain of the nature of the relationship between the variables being graphed. There is a great danger of implying something that is not there. You, therefore, need to be on guard against logical fallacies. Suppose, for instance, that you were doing a survey of women's clothing stores across the country. Reviewing the data you have collected, you notice that there seems to be a close relationship between two particular sets of numbers: the rent paid by the owners of the store and the average price of wool jackets sold. These data are shown in [Table T.9](#).

TABLE T.9

Monthly Rent (per 100 m ²)	Average Jacket Price
\$1500	\$ 80
1600	90
1700	100
1800	110
1900	120
2000	130

The higher the monthly rent, the higher is the price of jackets charged in that store. It seems clear, therefore, that the higher rent is the cause of the higher price, and the higher price is the effect of the higher rent. After all, the store owner must recoup these higher rent costs by charging her customers a higher price. If you think this, then you are guilty of the logical fallacy of *reverse causality*. As you will learn in economics, although rent and product prices are indeed related, the causality is in fact the other way around. This is because stores in certain areas can charge higher product prices because of their trendy location, and landlords charge those stores higher rents for the same reason—it is a desirable location. Higher prices, therefore, are the cause and high rents the effect. This is not obvious and illustrates how using raw economic data without sound economic theory can lead to serious error.

A second logical fallacy is that of the *omitted variable*, which can also lead to confusion over cause and effect. [Table T.10](#) highlights this error. Here, we see hypothetical data on rates of alcoholism and the annual income levels of individuals.

TABLE T.10

Average Income Levels (\$)	Alcoholism (per thousand of population)
5 000	40
15 000	35
25 000	30
35 000	25
45 000	20
55 000	15

There certainly seems to be a very close relationship between these two variables. Presented in this form, without any commentary, one is left to wonder if low income causes alcoholism or if alcoholism is the cause of low income. Perhaps some people with low incomes drink in order to try to escape the effects of poverty. Or perhaps it implies that people who drink to excess have great difficulty in finding or keeping a good job. In truth, it is possible that neither of these views is true. Simply because two sets of data seem closely related does not necessarily mean that one is the cause of the other. In fact, it may well be that both are caused by an omitted variable. In the above example, it is possible, for instance, that both high alcoholism and low income levels are the result of low educational attainment.

A third fallacy can occur when people see a cause and effect relationship that does not really exist. This is known as the fallacy of *post hoc, ergo propter hoc*, which literally means “after this, therefore because of this.” That is to say, it is a fallacy to believe that, just because one thing follows another, one is the result of the other. For example, just because my favourite soccer team always loses whenever I go to see them, that does not mean I am the cause of their losing!

There is a final fallacy you should guard against, a fallacy, unfortunately, that even the best economists commit from time to time. This is the *fallacy of composition*, which is the belief that because something is true for a part, it is true for the whole. You may have noticed, for instance, that fights occasionally break out in hockey games. These fights often occur in the corners of the rink, which makes them difficult to see. The best way for individuals to get a better view is by standing, and, of course, when everybody stands, then most people cannot see. Thus, what is true for a single fan—standing up to see better—is not true for the whole crowd. Similarly, a teacher who suggests that in order to get good grades students should sit at the front of the class is guilty of the same kind of logical fallacy!

We hope that this little primer on Canada and on graphing has been helpful. It is now time to move on to the study of economics.



STUDY GUIDE

Problems for Further Study

Indicate whether the following statements are true or false:

1. **T or F** Canada is the world's largest country in area and has 1 percent of the world's population.
2. **T or F** Ontario has the largest provincial economy and the largest provincial population, and it is Canada's largest province in area.
3. **T or F** Over 50 percent of Canada's exports are resources.
4. **T or F** The largest single source of government tax revenue is personal income taxes.
5. **T or F** Spending on social services is the largest category of spending by (all) governments in Canada.
6. **T or F** Three popular types of graphs are pie charts, bar graphs, and line graphs.
7. **T or F** Since disposable income and consumer spending both rise together over time, there is a direct relationship between the two.
8. **T or F** The slope of a straight line is measured by dividing the run by the rise.
9. **T or F** If the equation $Y = 5 + 2X$ were plotted, the slope of the line would be equal to $1/2$.
10. **T or F** The logic fallacy *post hoc, ergo propter hoc* means "after this, therefore because of this."

Simple Calculations

11. **Table T.11** shows the dollar value of commercial sea fishing in Canada for 2002.
 - a) From these data, construct a bar chart.
 - b) Construct a pie chart showing the percentage of the total that each species represents.

TABLE T.11

	\$million
Groundfish (including cod, halibut, etc.)	288
Pelagic fish (including salmon and herring)	185
Lobster	594
Crab	505
Shrimp	294
Other shellfish	254
Total value	2 120

12. Complete the following schedules, and plot the following equations:

a) $Y = -200 + 2X$

Y	X
	0
	100
	200
	300
	400

b) $Y = 500 - 4X$

Y	X
	0
	100
	200
	300
	400

13. Given the lines shown in **Figure T.12**, complete the following tables, and calculate the equations for the lines:

a)

Y	X
	0
	20
	40
	60
	80
	100

b)

Y	X
	0
	20
	40
	60
	80
	100

14. The data in **Table T.12** show the results of market research done on the latest Guns 'n' Butter album. The numbers indicate the total quantity of albums that fans would purchase at the various prices.

TABLE T.12

Price per CD	Quantity (hundreds of thousands)
\$20	20
19	30
18	40
17	50
16	60
15	70
14	80

- Graph the table with the price on the vertical (y) axis and the quantity on the horizontal (x) axis.
- What is the slope of the line?
- What is the value of the Y-intercept?
- What is the equation for this line?

15. What are the values of the slopes of the four lines shown in **Figure T.13**?

16. What are the equations that correspond to the four lines shown in **Figure T.14**?

17. Graph the following equations on a single graph, using the same scale for each axis, with the horizontal axis to 120 and the vertical axis to 200, both in squares of 10.

- $Y = \frac{1}{2}X$
- $Y = 40 + X$
- $Y = 160 - \frac{1}{2}X$
- $Y = -10 + 2X$

FIGURE T.12

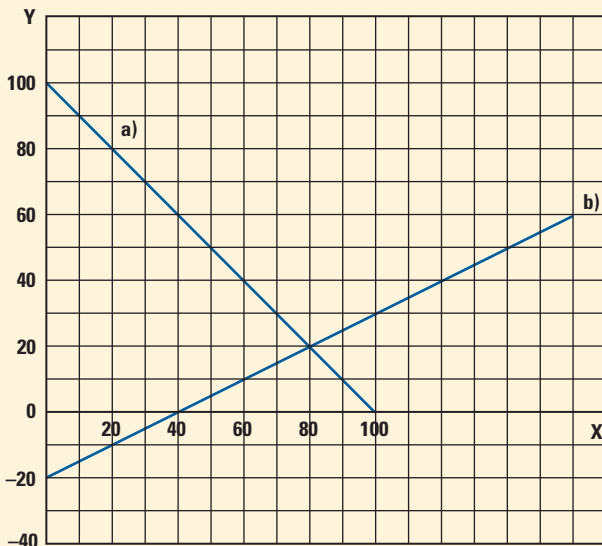


FIGURE T.13

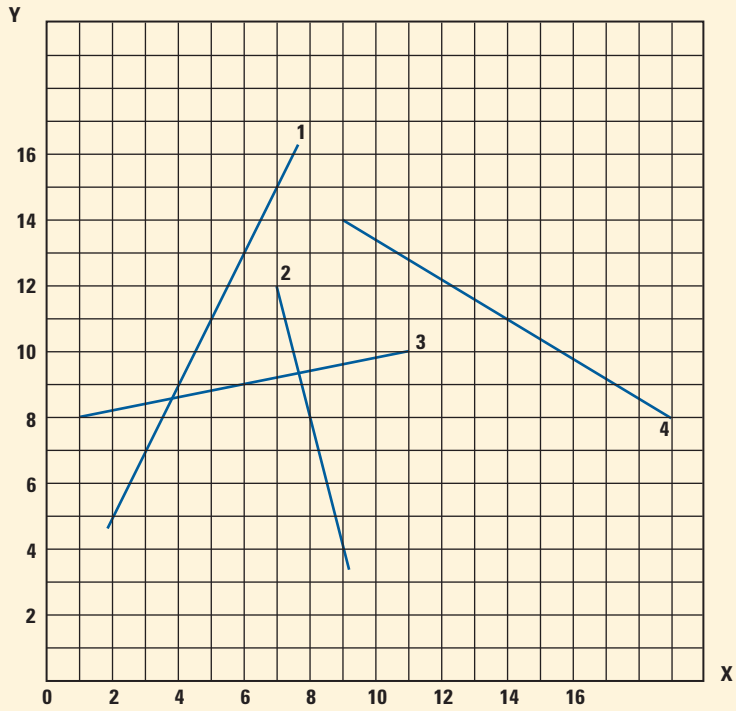
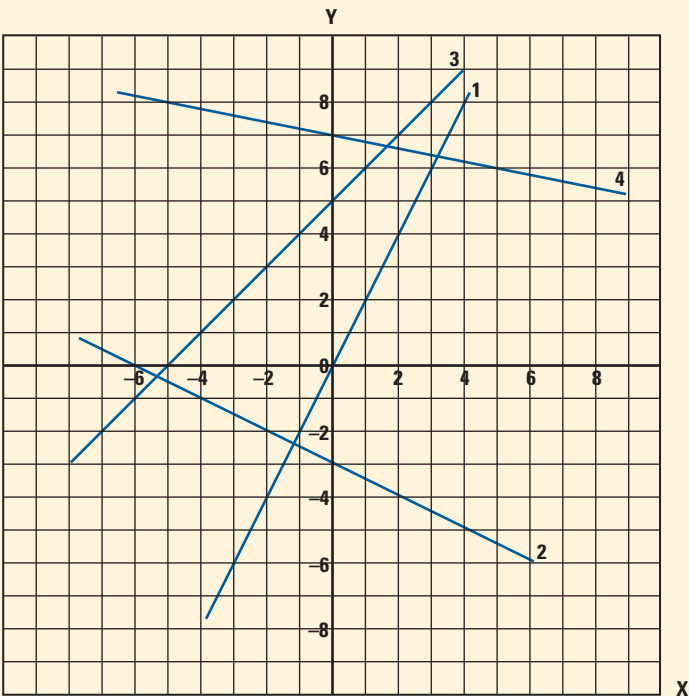


FIGURE T.14



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CHAPTER 1

The Economic Problem

WHAT'S AHEAD ...

In this first chapter, we introduce you to the study of economics and hope to arouse your curiosity about this fascinating discipline. First, we present six controversial statements to illustrate how relevant economics really is. Next, we discuss the nature of the discipline. From this, we derive a formal definition of economics. Then, we examine what efficiency means and why it is so important. The next step is to look at three of the fundamental questions that all societies face and see how four different types of economies address them. Following that, we introduce the production possibilities model, which enables us to illustrate many of these concepts. Finally, we discuss seven important macroeconomic goals and briefly look at the policy tools used to achieve them.

A Question of Relevance ...

Jon and Ashok are both avid soccer fans and play for local teams. They both like old movies, chess, and use Twitter. They are both seventeen years of age, neither has a steady girlfriend, and both are vegetarians. The other thing they have in common is that their fathers are in banking. Jon's father is the executive vice-president of customer relations for the Royal Bank of Canada in Toronto. Ashok's father is a night janitor at a branch of the Bank of India in the dock area of Bombay. All of these points are relevant in forming a mental picture of a person, but you will probably agree that a person's economic circumstances have an enormous impact. In truth, economics is one of the most relevant subjects you will study.

Learning Objectives

At the end of this chapter, you should be able to:

- LO1** Describe why economics is a very relevant discipline by demonstrating that many of the controversies in our society have a distinct economic flavour.
- LO2** Define economics and then make a distinction between microeconomics and macroeconomics.
- LO3** Demonstrate that because scarcity, choice, and opportunity cost are at the heart of economics, efficiency—both productive and allocative—provides a major cornerstone.
- LO4** Explain why greater trade results in more productive economies.
- LO5** Explain the three fundamental questions that all societies must address and the four different ways that economic societies can be organized.
- LO6** Use the production possibilities model to illustrate choice and opportunity cost, as well as efficiency and unemployment.
- LO7** List the economic goals of society and explain why they are often difficult to achieve.