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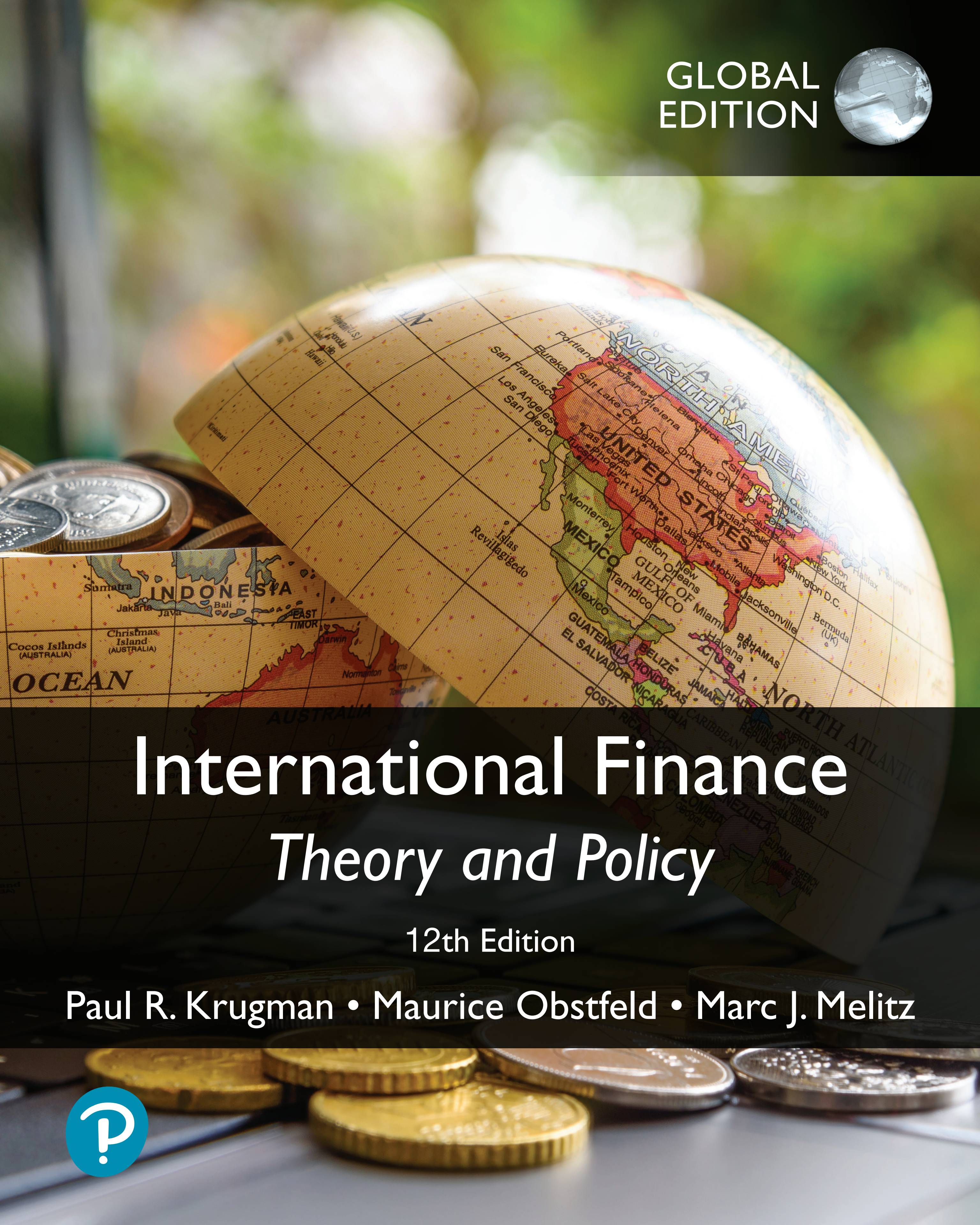


# International Finance

## *Theory and Policy*

12th Edition

Paul R. Krugman • Maurice Obstfeld • Marc J. Melitz

# International Finance

## THEORY & POLICY

TWELFTH EDITION

GLOBAL EDITION

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# Brief Contents

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# Preface

Nothing illustrates better than the COVID-19 pandemic how movements of people, flows of data, and commerce connect our interdependent world. Because pathogens do not respect national borders, the SARS-CoV-2 virus caused a global economic shock and a worldwide downturn, sending governments throughout the world scrambling for policies to stop the spread of the disease while supporting their economies. As this book went to press, the crisis was still underway, with the arrival of several effective vaccines giving hope of a road back to normalcy. Many lessons will be drawn from the recent pandemic experience, but one is the importance of an international perspective for analyzing events of worldwide economic significance and countries' responses. The purpose of this book is to equip students with intellectual tools for understanding the economic implications of global interdependence.

## What's New in the Twelfth Edition

We have thoroughly updated the content and extensively revised several chapters. These revisions respond both to users' suggestions and to some important developments on the theoretical and practical sides of international economics. The most far-reaching changes are the following:

- **Chapter 2, National Income Accounting and the Balance of Payments** A notable recent trend has been the movement of intellectual property and other intangible capital across borders for the purpose of minimizing corporate tax burdens. This chapter features a new box describing how Ireland's accommodative tax regime has led to anomalies in its GDP data. While the description of cross-border profit shifting will be of substantive interest to students, the Irish example also illustrates the limitations of GDP as a measure of national economic activity or welfare.
- **Chapter 3, Exchange Rates and the Foreign Exchange Market: An Asset Approach** A striking empirical regularity of the period since the global financial crisis of 2008–2009 has been the continuing failure of covered interest parity as an empirical regularity. This revised chapter moves the material on covered interest parity from an appendix to the main text, provides added emphasis on the distinction between uncovered and covered interest parity, and foreshadows a new discussion in Chapter 9 on the reasons behind recent departures from covered interest parity.
- **Chapter 4, Money, Interest Rates, and Exchange Rates** This chapter now uses the recent hyperinflation in Venezuela as an example to underscore the long-run relationship between money supply and prices.
- **Chapter 6, Output and the Exchange Rate in the Short Run** The chapter adds material on how global value chains influence exchange rate pass-through.
- **Chapter 8, International Monetary Systems: A Historical Overview** We extend the historical narrative to cover the effects of the Trump trade war on global trade and the COVID-19 pandemic. An important addition is a new box on the question of currency manipulation—a topic that draws on much of what students will have learned up to this point in the book and is likely to retain relevance in coming years.
- **Chapter 9, Financial Globalization: Opportunity and Crisis** We link ongoing deviations from covered interest parity to changing financial regulations, and we also introduce the exchange rate disconnect puzzle.

- **Chapter 10, Optimum Currency Areas and the Euro** The chapter updates the discussion of Brexit to cover the 11th-hour partial trade deal that the EU and United Kingdom reached in December 2020 as well as the prior withdrawal agreement and its implications for the Irish border. Also included is coverage of euro area policy innovations in response to the COVID-19 pandemic.
- **Chapter 11, Developing Countries: Growth, Crisis, and Reform** A new box highlights the key role of global financial conditions in driving emerging economies' growth—the global financial cycle. Key topics explored include the motivations for emerging market economies to manage their exchange rates and the benefits of exchange rate flexibility in the face of global financial forces.

# Solving Learning and Teaching Challenges

The idea of writing this book came out of our experience in teaching international economics to undergraduates and business students since the late 1970s. We perceived two main challenges in teaching. The first was to communicate to students the exciting intellectual advances in this dynamic field. The second was to show how the development of international economic theory has traditionally been shaped by the need to understand the changing world economy and analyze actual problems in international economic policy.

We found that published textbooks did not adequately meet these challenges. Too often, international economics textbooks confront students with a bewildering array of special models and assumptions from which basic lessons are difficult to extract. Because many of these special models are outmoded, students are left puzzled about the real-world relevance of the analysis. As a result, many textbooks often leave a gap between the somewhat antiquated material to be covered in class and the exciting issues that dominate current research and policy debates. That gap has widened dramatically as the importance of international economic problems—and alongside that, enrollment in international economics courses—has grown.

This book is our attempt to provide an up-to-date and understandable analytical framework for illuminating current events and bringing the excitement of international economics into the classroom. In analyzing both the real and monetary sides of the subject, our approach has been to build up, step-by-step, a simple, unified framework for communicating the grand traditional insights as well as the newest findings and approaches. To help the student grasp and retain the underlying logic of international economics, we motivate the theoretical development at each stage by pertinent data and policy questions.

Students assimilate international economics most readily when it is presented as a method of analysis vitally linked to events in the world economy rather than as a body of abstract theorems about abstract models. Our goal has therefore been to stress concepts and their application rather than theoretical formalism. Accordingly, the book does not presuppose an extensive background in economics. Students who have had a course in economic principles will find the book accessible, but students who have taken further courses in microeconomics or macroeconomics will find an abundant supply of new material. Specialized appendices and mathematical postscripts have been included to challenge the most advanced students.

## Our Vision

Years after the global financial crisis of 2008–2009, the world economy is still afflicted by tepid economic growth and, for many people, stagnating incomes. This bleak picture has been accentuated by the economic shock dealt by the COVID-19 pandemic. Extensive attempts by governments to support their economies, while successful in avoiding worst-case scenarios, will leave countries worldwide with legacies of sharply higher public debts, decimated service sectors, and deeply scarred labor forces. Emerging markets remain vulnerable to the ebb and flow of global capital and the ups and downs of world commodity prices. Uncertainty weighs on investment globally, driven not least by worries about the future of the liberal international trade regime built up so painstakingly after World War II.

This twelfth edition therefore comes out at a time when we are more aware than ever before of how events in the global economy influence each country's economic fortunes, policies, and political debates. The world that emerged from World War II was one in which trade, financial, and even communication links between countries were limited. Nearly two decades into the 21st century, however, the picture is very different. Globalization has arrived big-time. International trade in goods and services has expanded steadily over the past six decades thanks to declines in shipping and communication costs, globally negotiated reductions in government trade barriers, the widespread outsourcing of production activities, and a greater awareness of foreign cultures and products. New and better communications technologies, notably the Internet, have revolutionized the way people in all countries obtain and exchange information. International trade in financial assets such as currencies, stocks, and bonds has expanded at a much faster pace even than international product trade. This process brings benefits for owners of wealth but also creates risks of contagious financial instability. Those risks were realized during the recent global financial crisis, which spread quickly across national borders and has played out at huge cost to the world economy. Of all the changes on the international scene in recent decades, however, perhaps the biggest one remains the emergence of China—a development that is already redefining the international balance of economic and political power in the coming century.

Imagine how astonished the generation that lived through the depressed 1930s as adults would have been to see the shape of today's world economy! Nonetheless, the economic concerns that drive international debate have not changed that much from those that dominated the 1930s nor indeed since they were first analyzed by economists more than two centuries ago. What are the merits of free trade among nations compared with protectionism? What causes countries to run trade surpluses or deficits with their trading partners, and how are such imbalances resolved over time? What causes banking and currency crises in open economies, what causes financial contagion between economies, and how should governments handle international financial instability? How can governments avoid unemployment and inflation, what role do exchange rates play in their efforts, and how can countries best cooperate to achieve their economic goals? As always in international economics, the interplay of events and ideas has led to new modes of analysis. In turn, these analytical advances, however abstruse they may seem at first, ultimately do end up playing a major role in governmental policies, in international negotiations, and in people's everyday lives. Globalization has made citizens of all countries much more aware than ever before of the worldwide economic forces that influence their fortunes. Despite some predictions that the recent pandemic may put the brakes on globalization, it seems more likely that most aspects of globalization will survive once the COVID-19 virus is finally vanquished. As the book illustrates, globalization can be an engine of prosperity, but like any powerful machine, it can do damage if managed unwisely. The challenge for the global community is to get the most out of globalization while coping with the challenges that it raises for economic policy.

To help students explore this complex landscape, this book covers the most important recent developments in international economics without shortchanging the enduring theoretical and historical insights that have traditionally formed the core of the subject. We have achieved this comprehensiveness by stressing how recent theories have evolved from earlier findings in response to an evolving world economy. This book is divided into a core of chapters focused on theory, followed by chapters applying the theory to major policy questions, past and current.

In Chapter 1, we describe in some detail how this book addresses the major themes of international economics. Here we emphasize several of the topics that previous authors failed to treat in a systematic way.

**Asset Market Approach to Exchange Rate Determination** The modern foreign exchange market and the determination of exchange rates by national interest rates and expectations are at the center of our account of open-economy macroeconomics. The main ingredient of the macroeconomic model we develop is the interest parity relation, augmented later by risk premiums (Chapter 3). Among the topics we address using the model are exchange rate "overshooting," inflation targeting, behavior of real exchange rates, balance-of-payments crises under fixed exchange rates, and the causes and effects of central bank intervention in the foreign exchange market (Chapters 4 through 7).

**International Macroeconomic Policy Coordination** Our discussion of international monetary experience (Chapters 8 through 11) stresses the theme that different exchange rate systems have led to different policy coordination problems for their members. Just as the competitive gold scramble of the interwar years showed how beggar-thy-neighbor policies can be self-defeating, the current float challenges national policymakers to recognize their interdependence and formulate policies cooperatively.

**The World Capital Market and Developing Countries** A broad discussion of the world capital market is given in Chapter 9, which takes up the welfare implications of international portfolio diversification as well as problems of prudential supervision of internationally active banks and other financial institutions. Chapter 11 covers the long-term growth prospects and the specific macroeconomic stabilization and liberalization problems of industrializing and newly industrialized countries. The chapter reviews emerging market crises and places in historical perspective the interactions among developing country borrowers, developed country lenders, and official financial institutions such as the International Monetary Fund.

## Features

This book incorporates a number of special learning features that will maintain students' interest in the presentation and help them master its lessons.

**Case Studies** Case studies that perform the threefold role of reinforcing material covered earlier, illustrating its applicability in the real world, and providing important historical information often accompany theoretical discussions.

**Special Boxes** Less central topics that nonetheless offer particularly vivid illustrations of points made in the text are treated in boxes.

**Captioned Diagrams** The diagrams are accompanied by descriptive captions that reinforce the discussion in the text and help the student in reviewing the material.

**Learning Goals** A list of essential concepts sets the stage for each chapter in the book. These learning goals help students assess their mastery of the material.

**Summary and Key Terms** Each chapter closes with a summary recapitulating the major points. Key terms and phrases appear in boldface type when they are introduced in the chapter and are listed at the end of each chapter. To further aid student review of the material, key terms are italicized when they appear in the chapter summary.

**Problems** Each chapter is followed by problems intended to test and solidify students' comprehension. The problems range from routine computational drills to "big picture" questions suitable for classroom discussion. In many problems we ask students to apply what they have learned to real-world data or policy questions.

**Further Readings** For instructors who prefer to supplement the textbook with outside readings and for students who wish to probe more deeply on their own, each chapter has an annotated bibliography that includes established classics as well as up-to-date examinations of recent issues.

**Supplementary Resources** A full range of additional supplementary materials to support teaching and learning accompanies this book.

- The Online Instructor's Manual—updated by Hisham Foad of San Diego State University and K. Michael Casey of University of Central Arkansas—includes chapter overviews and answers to end-of-chapter problems.
- The Online Test Bank offers a rich array of multiple-choice and essay questions, including some mathematical and graphing problems, for each textbook chapter. It is available in Word, PDF, and TestGen formats. This Test Bank was carefully revised and updated by Van Pham of Salem State University. Rafael Alfena Zago from the University of Oklahoma performed accuracy review of the Test Bank.
- The Accessible Online PowerPoint Presentation was updated by Amy Glass of Texas A&M University. This resource contains text figures and tables and can be used for in-class presentations.

For more information and resources, visit www.pearsonglobaleditions.com.

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*Paul R. Krugman*
*Maurice Obstfeld*
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# CHAPTER 1

# Introduction

You could say that the study of international trade and finance is where the discipline of economics as we know it began. Historians of economic thought often describe the essay "Of the Balance of Trade" by the Scottish philosopher David Hume as the first real exposition of an economic model. Hume published his essay in 1758, almost 20 years before his friend Adam Smith published *The Wealth of Nations*. And the debates over British trade policy in the early 19th century did much to convert economics from a discursive, informal field to the model-oriented subject it has been ever since.

Yet the study of international economics has never been as important as it is now. In the early 21st century, nations are more closely linked than ever before through trade in goods and services, flows of money, and investment in each other's economies. And the global economy created by these linkages is a turbulent place: Both policy makers and business leaders in every country must now pay attention to what are sometimes rapidly changing economic fortunes halfway around the world.

A look at some basic trade statistics gives us a sense of the unprecedented importance of international economic relations. Figure 1-1 shows the levels of U.S. exports and imports as shares of gross domestic product from 1960 to 2019. The most obvious feature of the figure is the long-term upward trend in both shares: International trade has roughly tripled in importance compared with the economy as a whole.

Almost as obvious is that, while both imports and exports have increased, imports have grown more, leading to a large excess of imports over exports. How is the United States able to pay for all those imported goods? The answer is that the money is supplied by large inflows of capital—money invested by foreigners willing to take a stake in the U.S. economy. Inflows of capital on that scale would once have been inconceivable; now they are taken for granted. And so the gap between imports and exports is an indicator of another aspect of growing international linkages—in this case the growing linkages between national capital markets.

Finally, notice that both imports and exports plunged temporarily in 2009, during the global economic crisis that began in 2008; they fell again in 2020, during the COVID-19 pandemic. These declines are reminders of the close links between world trade and the overall state of the world economy.

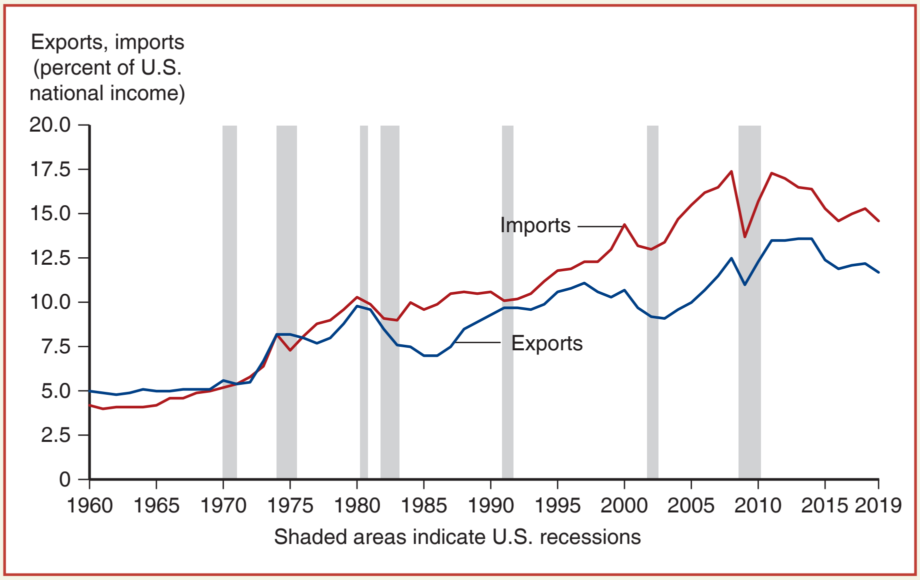



FIGURE 1-1

**Exports and Imports as a Percentage of U.S. National Income (Shaded areas indicate U.S. recessions.)**

Both imports and exports have risen as a share of the U.S. economy, but imports have risen more.

**Source:** U.S. Bureau of Economic Analysis. research.stlouisfed.org

If international economic relations have become crucial to the United States, they are even more crucial to other nations. Figure 1-2 shows the average of imports and exports as a share of GDP for a sample of countries. The United States, by virtue of its size and the diversity of its resources, relies less on international trade than almost any other country.

This text introduces the main concepts and methods of international economics and illustrates them with applications drawn from the real world. Much of the text is devoted to old ideas that are still as valid as ever: The 19th-century trade theory of David Ricardo and even the 18th-century monetary analysis of David Hume remain highly relevant to the 21st-century world economy. At the same time, we have made a special effort to bring the analysis up to date. In particular, the economic crisis that began in 2007 threw up major new challenges for the global economy. Economists were able to apply existing analyses to some of these challenges, but they were also forced to rethink some important concepts. Furthermore, new approaches have emerged to old questions, such as the impacts of changes in monetary and fiscal policy. We have attempted to convey the key ideas that have emerged in recent research while stressing the continuing usefulness of old ideas.

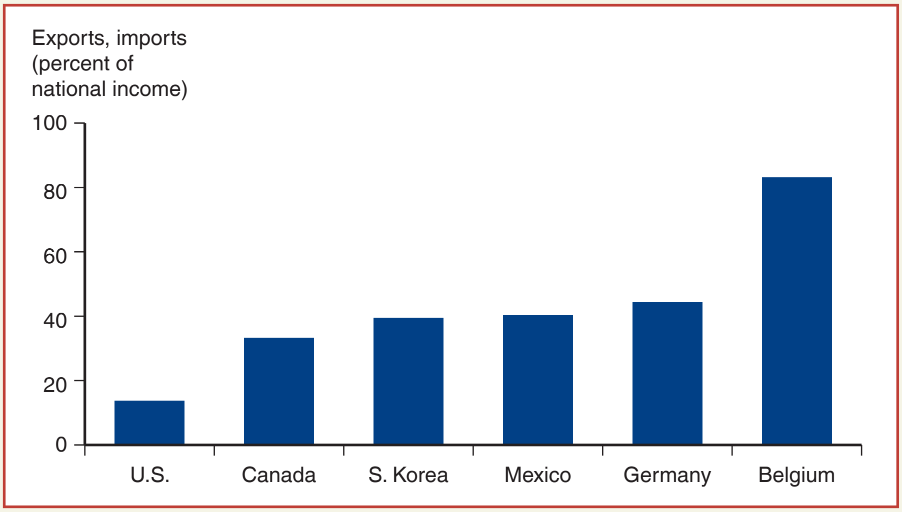



FIGURE 1-2

**Average of Exports and Imports as Percentages of National Income in 2018**

International trade is even more important to most other countries than it is to the United States.

**Source:** World Bank.

## LEARNING GOALS

After reading this chapter, you will be able to:

- Distinguish between international and domestic economic issues.
- Explain why seven themes recur in international economics and discuss their significance.
- Distinguish between the trade and monetary aspects of international economics.

# What Is International Economics About?

International economics uses the same fundamental methods of analysis as other branches of economics because the motives and behavior of individuals are the same in international trade as they are in domestic transactions. Gourmet food shops in Florida sell coffee beans from both Mexico and Hawaii; the sequence of events that brought those beans to the shop is not very different, and the imported beans traveled a much shorter distance than the beans shipped within the United States! Yet international economics involves new and different concerns because international trade and investment occur between independent nations. The United States and Mexico are sovereign states; Florida and Hawaii are not. Mexico's coffee shipments to Florida could be disrupted if the U.S. government imposed a quota that limits imports; Mexican coffee could suddenly become cheaper to U.S. buyers if the peso were to fall in value against the dollar. By contrast, neither of those events can happen in commerce within the United States because the Constitution forbids restraints on interstate trade and all U.S. states use the same currency.

The subject matter of international economics, then, consists of issues raised by the special problems of economic interaction between sovereign states. Seven themes recur throughout the study of international economics: (1) the gains from trade, (2) the pattern of trade, (3) protectionism, (4) the balance of payments, (5) exchange rate determination, (6) international policy coordination, and (7) the international capital market.

## The Gains from Trade

Everybody knows that some international trade is beneficial—for example, nobody thinks that Norway should grow its own oranges. Many people are skeptical, however, about the benefits of trading for goods that a country could produce for itself. Shouldn't Americans buy American goods whenever possible to help create jobs in the United States?

Probably the most important single insight in all of international economics is that there are *gains from trade*—that is, when countries sell goods and services to each other, this exchange is almost always to their mutual benefit. The range of circumstances under which international trade is beneficial is much wider than most people imagine. For example, it is a common misconception that trade is harmful if large disparities exist between countries in productivity or wages. On one side, businesspeople in less technologically advanced countries, such as India, often worry that opening their economies to international trade will lead to disaster because their industries won't be able to compete. On the other side, people in technologically advanced nations where workers earn high wages often fear that trading with less advanced, lower-wage countries will drag their standard of living down—one presidential candidate memorably warned of a "giant sucking sound" if the United States were to conclude a free trade agreement with Mexico.

Yet two countries can trade to their mutual benefit even when one of them is more efficient than the other at producing everything and when producers in the less-efficient country can compete only by paying lower wages. Trade provides benefits by allowing countries to export goods whose production makes relatively heavy use of resources that are locally abundant while importing goods whose production makes heavy use of resources that are locally scarce. International trade also allows countries to specialize in producing narrower ranges of goods, giving them greater efficiencies of large-scale production.

Nor are the benefits of international trade limited to trade in tangible goods. International migration and international borrowing and lending are also forms of mutually beneficial trade—the first a trade of labor for goods and services, the second a trade of current goods for the promise of future goods. Finally, international exchanges of risky assets such as stocks and bonds can benefit all countries by allowing each country to diversify its wealth and reduce the variability of its income. These invisible forms of trade yield gains as real as the trade that puts fresh fruit from Latin America in Toronto markets in February.

Although nations generally gain from international trade, it is quite possible that international trade may hurt particular groups *within* nations—in other words, that international trade will have strong effects on the distribution of income. The effects of trade on income distribution have long been a concern of international trade theorists who have pointed out that:

> International trade can adversely affect the owners of resources that are "specific" to industries that compete with imports, that is, cannot find alternative employment in other industries. Examples would include specialized machinery, such as power looms made less valuable by textile imports, and workers with specialized skills, like fishermen who find the value of their catch reduced by imported seafood.
>
> Trade can also alter the distribution of income between broad groups, such as workers and the owners of capital.

These concerns have moved from the classroom into the center of real-world policy debate as it has become increasingly clear that the real wages of less-skilled workers in the United States have been declining—even though the country as a whole is continuing to grow richer. Many commentators attribute this development to growing international trade, especially the rapidly growing exports of manufactured goods from low-wage countries. Assessing this claim has become an important task for international economists.

## The Pattern of Trade

Economists cannot discuss the effects of international trade or recommend changes in government policies toward trade with any confidence unless they know their theory is good enough to explain the international trade that is actually observed. As a result, attempts to explain the pattern of international trade—who sells what to whom—have been a major preoccupation of international economists.

Some aspects of the pattern of trade are easy to understand. Climate and resources clearly explain why Brazil exports coffee and Saudi Arabia exports oil. Much of the pattern of trade is more subtle, however. Why does Japan export automobiles while the United States exports aircraft? In the early 19th century, English economist David Ricardo offered an explanation of trade in terms of international differences in labor productivity, an explanation that remains a powerful insight. In the 20th century, however, alternative explanations also were proposed. One of the most influential explanations links trade patterns to an interaction between the relative supplies of national resources such as capital, labor, and land on one side and the relative use of these factors in the production of different goods on the other. Also, some international economists have proposed theories that suggest a substantial random component, along with economies of scale, in the pattern of international trade.

## How Much Trade?

If the idea of gains from trade is the most important theoretical concept in international economics, the seemingly eternal debate over how much trade to allow is its most important policy theme. Since the emergence of modern nation-states in the 16th century, governments have worried about the effect of international competition on the prosperity of domestic industries and have tried either to shield industries from foreign competition by placing limits on imports or to help them in world competition by subsidizing exports. The single most consistent mission of international economics has been to analyze the effects of these so-called protectionist policies—and usually, though not always, to criticize protectionism and show the advantages of freer international trade.

The debate over how much trade to allow took a new direction in the 1990s. After World War II the advanced democracies, led by the United States, pursued a broad policy of removing barriers to international trade; this policy reflected the view that free trade was a force not only for prosperity but also for promoting world peace. In the first half of the 1990s, several major free trade agreements were negotiated. The most notable were the North American Free Trade Agreement (NAFTA) between the United States, Canada, and Mexico, approved in 1993, and the so-called Uruguay Round agreement, which established the World Trade Organization in 1994.

Since then, however, there has been considerable backlash against "globalization." In 2016, Britain shocked the political establishment by voting to leave the European Union, which guarantees free movement of goods and people among its members. In that same year, claims that competition from imports and unfair trade deals have cost jobs played an important role in the U.S. presidential campaign. One consequence of this anti-globalization backlash is that free trade advocates are under greater pressure than ever before to find ways to explain their views.

As befits both the historical importance and the current relevance of the protectionist issue, roughly a quarter of this text is devoted to this subject. Over the years, international economists have developed a simple yet powerful analytical framework for determining the effects of government policies that affect international trade. This framework helps predict the effects of trade policies, while also allowing for cost-benefit analysis and defining criteria for determining when government intervention is good for the economy.

In the real world, however, governments do not necessarily do what the cost-benefit analysis of economists tells them they should. This does not mean that analysis is useless. Economic analysis can help make sense of the politics of international trade policy by showing who benefits and who loses from such government actions as quotas on imports and subsidies to exports. The key insight of this analysis is that conflicts of interest *within* nations are usually more important in determining trade policy than conflicts of interest *between* nations. Trade usually has very strong effects on income distribution within countries, whereas the relative power of different interest groups within countries, rather than some measure of overall national interest, is often the main determining factor in government policies toward international trade.

## Balance of Payments

In 1998, both China and South Korea ran large trade surpluses of about $40 billion each. In China's case, the trade surplus was not out of the ordinary—the country had been running large surpluses for several years, prompting complaints from other countries, including the United States, that China was not playing by the rules. So is it good to run a trade surplus and bad to run a trade deficit? Not according to the South Koreans: Their trade surplus was forced on them by an economic and financial crisis, and they bitterly resented the necessity of running that surplus.

This comparison highlights the fact that a country's *balance of payments* must be placed in the context of an economic analysis to understand what it means. It emerges in a variety of specific contexts: in discussing foreign direct investment by multinational corporations, in relating international transactions to national income accounting (Chapter 2), and in discussing virtually every aspect of international monetary policy. Like the problem of protectionism, the balance of payments has become a central issue for the United States because the nation has run huge trade deficits every year since 1982.

## Exchange Rate Determination

In September 2010, Brazil's finance minister, Guido Mantegna, made headlines by declaring that the world was "in the midst of an international currency war." The occasion for his remarks was a sharp rise in the value of Brazil's currency, the *real*, which was worth less than 45 cents at the beginning of 2009 but had risen to almost 60 cents when he spoke (and would rise to 65 cents over the next few months). Mantegna accused wealthy countries—the United States in particular—of engineering this rise, which was devastating to Brazilian exporters. However, the surge in the *real* proved short-lived; the currency began dropping in mid-2011, and by the summer of 2013 it was back down to only 45 cents.

A key difference between international economics and other areas of economics is that countries usually have their own currencies—the euro, which is shared by a number of European countries, being the exception that proves the rule. And as the example of the *real* illustrates, the relative values of currencies can change over time, sometimes drastically.

For historical reasons, the study of exchange rate determination is a relatively new part of international economics. For much of modern economic history, exchange rates were fixed by government action rather than determined in the marketplace. Before World War I, the values of the world's major currencies were fixed in terms of gold; for a generation after World War II, the values of most currencies were fixed in terms of the U.S. dollar. The analysis of international monetary systems that fix exchange rates remains an important subject. Chapter 7 is devoted to the working of fixed-rate systems, Chapter 8 to the historical performance of alternative exchange-rate systems, and Chapter 10 to the economics of currency areas such as the European monetary union. For the time being, however, some of the world's most important exchange rates fluctuate minute by minute and the role of changing exchange rates remains at the center of the international economics story. Chapters 3 through 6 focus on the modern theory of floating exchange rates.

## International Policy Coordination

The international economy comprises sovereign nations, each free to choose its own economic policies. Unfortunately, in an integrated world economy, one country's economic policies usually affect other countries as well. For example, when Germany's Bundesbank raised interest rates in 1990—a step it took to control the possible inflationary impact of the reunification of West and East Germany—it helped precipitate a recession in the rest of Western Europe. Differences in goals among countries often lead to conflicts of interest. Even when countries have similar goals, they may suffer losses if they fail to coordinate their policies. A fundamental problem in international economics is determining how to produce an acceptable degree of harmony among the international trade and monetary policies of different countries in the absence of a world government that tells countries what to do.

For almost 70 years, international trade policies have been governed by an international agreement known as the General Agreement on Tariffs and Trade (GATT). Since 1994, trade rules have been enforced by an international organization, the World Trade Organization, that can tell countries, including the United States, that their policies violate prior agreements. We discuss the rationale for this system in Chapter 9 and look at whether the current rules of the game for international trade in the world economy can or should survive.

While cooperation on international trade policies is a well-established tradition, coordination of international macroeconomic policies is a newer and more uncertain topic. Attempts to formulate principles for international macroeconomic coordination date to the 1980s and 1990s and remain controversial to this day. Nonetheless, attempts at international macroeconomic coordination are occurring with growing frequency in the real world. Both the theory of international macroeconomic coordination and the developing experience are reviewed in Chapter 8.

## The International Capital Market

In 2007, investors who had bought U.S. mortgage-backed securities—claims on the income from large pools of home mortgages—received a rude shock: As home prices began to fall, mortgage defaults soared, and investments they had been assured were safe turned out to be highly risky. Since many of these claims were owned by financial institutions, the housing bust soon turned into a banking crisis. And here's the thing: It wasn't just a U.S. banking crisis because banks in other countries, especially in Europe, had also bought many of these securities.

The story didn't end there: Europe soon had its own housing bust. And while the bust mainly took place in southern Europe, it soon became apparent that many northern European banks—such as German banks that had lent money to their Spanish counterparts—were also very exposed to the financial consequences.

In any sophisticated economy, there is an extensive capital market: a set of arrangements by which individuals and firms exchange money now for promises to pay in the future. The growing importance of international trade since the 1960s has been accompanied by a growth in the *international* capital market, which links the capital markets of individual countries. Thus in the 1970s, oil-rich Middle Eastern nations placed their oil revenues in banks in London or New York, and these banks in turn lent money to governments and corporations in Asia and Latin America. During the 1980s, Japan converted much of the money it earned from its booming exports into investments in the United States, including the establishment of a growing number of U.S. subsidiaries of Japanese corporations. Nowadays, China is funneling its own export earnings into a range of foreign assets, including dollars that its government holds as international reserves.

International capital markets differ in important ways from domestic capital markets. They must cope with special regulations that many countries impose on foreign investment; they also sometimes offer opportunities to evade regulations placed on domestic markets. Since the 1960s, huge international capital markets have arisen, most notably the remarkable London Eurodollar market, in which billions of dollars are exchanged each day without ever touching the United States.

Some special risks are associated with international capital markets. One risk is currency fluctuations: If the euro falls against the dollar, U.S. investors who bought euro bonds suffer a capital loss. Another risk is national default: A nation may simply refuse to pay its debts (perhaps because it cannot), and there may be no effective way for its creditors to bring it to court. Fears of default by highly indebted European nations have been a major concern in recent years.

The growing importance of international capital markets and their new problems demand greater attention than ever before. This text devotes two chapters to issues arising from international capital markets: one on the functioning of global asset markets (Chapter 9) and one on foreign borrowing by developing countries (Chapter 11).

## International Economics: Trade and Money

The economics of the international economy can be divided into two broad subfields: the study of *international trade* and the study of *international money*. International trade analysis focuses primarily on the *real* transactions in the international economy, that is, transactions involving a physical movement of goods or a tangible commitment of economic resources. International monetary analysis focuses on the *monetary* side of the international economy, that is, on financial transactions such as foreign purchases of U.S. dollars. An example of an international trade issue is the conflict between the United States and Europe over Europe's subsidized exports of agricultural products; an example of an international monetary issue is the dispute over whether the foreign exchange value of the dollar should be allowed to float freely or be stabilized by government action.

In the real world, there is no simple dividing line between trade and monetary issues. Most international trade involves monetary transactions, while, as the examples in this chapter already suggest, many monetary events have important consequences for trade. Nonetheless, the distinction between international trade and international money is useful. This text is devoted to international monetary issues. Part One (Chapters 2 through 8) develops international monetary theory, and Part Two (Chapters 8 through 11) applies this analysis to international monetary policy.

CHAPTER 2

# National Income Accounting and the Balance of Payments

Between 2014 and 2019, the world economy's total real product grew at an annual average rate of nearly 3.5 percent per year. Global growth was reasonably stable, fluctuating in a range between about 3.9 percent (in 2017) and 2.9 percent (in 2019). As the COVID-19 pandemic emerged in 2020, however, world economic growth suddenly turned sharply negative, with many economies shrinking by amounts unprecedented since the Great Depression of the 1930s. Unemployment rose sharply everywhere, including in the United States, but some countries (such as several in East Asia) suffered much less compared with others. Can economic analysis help us to understand the behavior of the global economy and the reasons why individual countries' fortunes often differ?

Previous chapters have been concerned primarily with the problem of making the best use of the world's scarce productive resources at a single point in time. The branch of economics called **microeconomics** studies this problem from the perspective of individual firms and consumers. Microeconomics works "from the bottom up" to show how individual economic actors, by pursuing their own interests, collectively determine how resources are used. In our study of international microeconomics, we have learned how individual production and consumption decisions produce patterns of international trade and specialization. We have also seen that while free trade usually encourages efficient resource use, government intervention or market failures can cause waste even when all factors of production are fully employed.

With this chapter, we shift our focus and ask: How can economic policy ensure that factors of production *are* fully employed? And what determines how an economy's capacity to produce goods and services changes over time? To answer these questions, we must understand **macroeconomics**, the branch of economics that studies how economies' overall levels of employment, production, and growth are determined. Like microeconomics, macroeconomics is concerned with the effective use of scarce resources. But while microeconomics focuses on the economic decisions of individuals, macroeconomics analyzes the behavior of an economy as a whole. In our study of international macroeconomics, we will learn how the interactions of national economies influence the worldwide pattern of macroeconomic activity.

Macroeconomic analysis emphasizes four aspects of economic life that, until now, we have usually kept in the background to simplify our discussion of international economics:

1. *Unemployment.* We know that in the real world, workers may be unemployed and factories may be idle. Macroeconomics studies the factors that cause unemployment and the steps governments can take to prevent it. A main concern of international macroeconomics is the problem of ensuring full employment in economies open to international trade.
2. *Saving.* In earlier chapters, we usually assumed that every country consumes an amount exactly equal to its income—no more and no less. In reality, though, households can put aside part of their income to provide for the future, or they can borrow temporarily to spend more than they earn. A country's saving or borrowing behavior affects domestic employment and future levels of national wealth. From the standpoint of the international economy as a whole, the world saving rate determines how quickly the world stock of productive capital can grow.
3. *Trade imbalances.* As we saw in earlier chapters, the value of a country's imports equals the value of its exports when spending equals income. Actual economies seldom attain this state of balanced trade, however. In the following chapters, trade imbalances play a large role because they redistribute wealth among countries and are a main channel through which one country's macroeconomic policies affect its trading partners. It should be no surprise, therefore, that trade imbalances, particularly when they are large and persistent, quickly can become a source of international discord.
4. *Money and the price level.* The trade theory you have studied so far is a barter theory, one in which goods are exchanged directly for other goods based on their relative prices. In practice, it is more convenient to use money—a widely acceptable medium of exchange—in transactions and to quote prices in terms of money. Because money changes hands in virtually every transaction that takes place in a modern economy, fluctuations in the supply of money or in the demand for it can affect both output and employment. International macroeconomics takes into account that every country uses a currency and that a monetary change (for example, a change in money supply) in one country can have effects that spill across its borders to other countries. Stability in money price levels is an important goal of international macroeconomic policy.

This chapter takes the first step in our study of international macroeconomics by explaining the accounting concepts economists use to describe a country's level of production and its international transactions. To get a complete picture of the macroeconomic linkages among economies that engage in international trade, we have to master two related and essential tools. The first of these tools, **national income accounting**, records all the expenditures that contribute to a country's income and output. The second tool, **balance of payments accounting**, helps us keep track of both changes in a country's indebtedness to foreigners and the fortunes of its export- and import-competing industries. The balance of payments accounts also show the connection between foreign transactions and national money supplies.

### LEARNING GOALS

After reading this chapter, you will be able to:

- Discuss the concept of the current account balance.
- Use the current account balance to extend national income accounting to open economies.
- Apply national income accounting to the interaction of saving, investment, and net exports.
- Describe the balance of payments accounts and explain their relationship to the current account balance.
- Relate the current account to changes in a country's net foreign wealth.

## The National Income Accounts

Of central concern to macroeconomic analysis is a country's **gross national product (GNP)**, the value of all final goods and services produced by the country's factors of production and sold on the market in a given time period. GNP, which is the basic measure of a country's output studied by macroeconomists, is calculated by adding up the market value of all expenditures on final output. GNP therefore includes the value of goods like bread sold in a supermarket and textbooks sold in a bookstore as well as the value of services provided by stockbrokers and plumbers. Because output requires factor inputs for its production, the expenditures that make up GNP connect intimately with the employment of labor, capital, and other factors of production.

To distinguish among the different types of expenditure that make up a country's GNP, government economists and statisticians who compile national income accounts divide GNP among the four possible uses for which a country's final output is purchased: *consumption* (the amount consumed by private domestic residents), *investment* (the amount put aside by private firms to build new plant and equipment for future production), *government purchases* (the amount used by the government), and the *current account balance* (the amount of net exports of goods and services to foreigners). The term *national income accounts*, rather than *national output accounts*, is used to describe this fourfold classification because a country's income in fact equals its output. Thus, we can think of the national income accounts as classifying each transaction that contributes to national income according to the type of expenditure that gives rise to it. Figure 2-1 shows how U.S. GNP was divided among its four components in the first quarter (January–March) of 2020.[1]

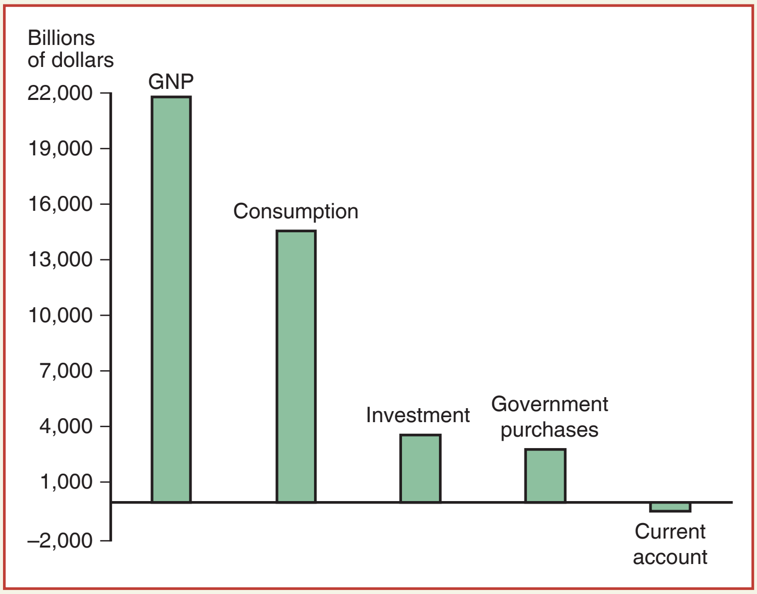
[1]In Figure 2-1, quarterly GNP and its components are measured at an annual rate (that is, they are multiplied by four). Our definition of the current account is not strictly accurate when a country is a net donor or recipient of foreign gifts. This possibility, along with some others, also complicates our identification of GNP with national income. We describe later in this chapter how the definitions of national income and the current account must be changed in such cases.

FIGURE 2-1

**U.S. GNP and Its Components**

America's gross national product for the first quarter of 2020 can be broken down into the four components shown.

**Source:** U.S. Department of Commerce, Bureau of Economic Analysis. The figure shows 2020:QI GNP and its components at an annual rate, seasonally adjusted.




Why is it useful to divide GNP into consumption, investment, government purchases, and the current account? One major reason is that we cannot hope to understand the cause of a particular recession or boom without knowing how the main categories of spending have changed. And without such an understanding, we cannot recommend a sound policy response. In addition, the national income accounts provide information essential for studying why some countries are rich—that is, have a high level of GNP relative to population size—while some are poor.

## National Product and National Income

Our first task in understanding how economists analyze GNP is to explain in greater detail why the GNP a country generates over some time period must equal its **national income**, the income earned in that period by its factors of production.

The reason for this equality is that every dollar used to purchase goods or services automatically ends up in somebody's pocket. A visit to the doctor provides a simple example of how an increase in national output raises national income by the same amount. The $75 you pay the doctor represents the market value of the services he or she provides for you, so your visit raises GNP by $75. But the $75 you pay the doctor also raises his or her income. So national income rises by $75.

The principle that output and income are the same also applies to goods, even goods produced with the help of many factors of production. Consider the example of an economics textbook. When you purchase a new book from the publisher, the value of your purchase enters GNP. But your payment enters the income of the productive factors that cooperated in producing the book because the publisher must pay for their services with the proceeds of sales. First, there are the authors, editors, artists, and compositors who provide the labor inputs necessary for the book's production. Second, there are the publishing company's shareholders, who receive dividends for having financed acquisition of the capital used in production. Finally, there are the suppliers of paper and ink, who provide the intermediate materials used in producing the book.

The paper and ink purchased by the publishing house to produce the book are *not* counted separately in GNP because their contribution to the value of national output is already included in the book's price. It is to avoid such double counting that we allow only the sale of *final* goods and services to enter into the definition of GNP. Sales of intermediate goods, such as paper and ink purchased by a publisher, are not counted. Notice also that the sale of a used textbook does not enter GNP. Our definition counts only final goods and services that are *produced*, and a used textbook does not qualify: It was counted in GNP at the time it was first sold. Equivalently, the sale of a used textbook does not generate income for any factor of production.

## Capital Depreciation and International Transfers

Because we have defined GNP and national income so that they are necessarily equal, their equality is really an identity. Two adjustments to the definition of GNP are required, however, before the identification of GNP and national income is entirely correct in practice.

1. GNP does not take into account the economic loss due to the tendency of machinery and structures to wear out as they are used. This loss, called *depreciation*, reduces the income of capital owners. To calculate national income over a given period, we must therefore subtract from GNP the depreciation of capital over the period. GNP less depreciation is called *net national product* (NNP).
2. A country's income may include unrequited gifts from residents of foreign countries, as well as taxes paid to or subsidies received from foreign governments. We call such increments to current income *unilateral transfers*. Examples of unilateral transfers of income are pension payments to retired citizens living abroad, reparation payments, and foreign aid such as relief funds donated to drought-stricken nations. For the United States in 2019, the balance of such payments amounted to around −$140 billion, representing a 0.65 percent of GNP net transfer to foreigners. Net unilateral transfers are part of a country's income but are not part of its product, and they must be added to NNP in calculations of national income.

National income equals GNP *less* depreciation *plus* net unilateral transfers. The difference between GNP and national income is by no means an insignificant amount, but macroeconomics has little to say about it, and it is of little importance for macroeconomic analysis. Therefore, for the purposes of this text, we usually use the terms *GNP* and *national income* interchangeably, emphasizing the distinction between the two only when it is essential.[2] Many countries emphasize the accounting concept of *Gross National Income* (GNI), which is equal to national income without an adjustment for depreciation. For most countries in most years, GNP and GNI do not differ greatly.

[2]Strictly speaking, government statisticians refer to what we have called "national income" as *national disposable income*. Their official concept of national income omits foreign net unilateral transfers. Once again, however, the difference between national income and national disposable income is usually unimportant for macroeconomic analysis. Unilateral transfers are alternatively referred to as *secondary income payments* to distinguish them from *primary income payments* consisting of cross-border wage and investment income. We will see this terminology later when we study balance of payments accounting.

### Gross Domestic Product

Most countries other than the United States have long reported **gross domestic product (GDP)** rather than GNP as their primary measure of national economic activity. In 1991, the United States began to follow this practice as well. GDP is supposed to measure the volume of production within a country's borders, whereas GNP equals GDP *plus* net receipts of factor income from the rest of the world. For the United States, these net receipts are primarily the income domestic residents earn on wealth they hold in other countries less the payments domestic residents make to foreign owners of wealth that is located in the domestic country.

GDP does not correct, as GNP does, for the portion of countries' production carried out using services provided by foreign-owned capital and labor. Consider an example: The profits of a Spanish factory with British owners are counted in Spain's GDP but are part of Britain's GNP. The services British capital provides in Spain are a service export from Britain; therefore, they are added to British GDP in calculating British GNP. At the same time, to figure Spain's GNP, we must subtract from its GDP the corresponding service import from Britain.

As a practical matter, movements in GDP and GNP usually do not differ greatly. We will focus on GNP in this text, however, because GNP tracks national income more closely than GDP does and national welfare depends more directly on national income than on domestic product.

## National Income Accounting for an Open Economy

In this section, we extend to the case of an open economy, the closed-economy national income accounting framework you may have seen in earlier economics courses. We begin with a discussion of the national income accounts because they highlight the key role of international trade in open-economy macroeconomic theory. Since a closed economy's residents cannot purchase foreign output or sell their own to foreigners, all of national income must be allocated to domestic consumption, investment, or government purchases. In an economy open to international trade, however, the closed-economy version of national income accounting must be modified because some domestic output is exported to foreigners while some domestic income is spent on imported foreign products.

The main lesson of this section concerns the relationship among national saving, investment, and trade imbalances. We will see that in open economies, saving and investment are not necessarily equal, as they are in a closed economy. This occurs because countries can save in the form of foreign wealth by exporting more than they import, and they can *dissave*—that is, reduce their foreign wealth—by exporting less than they import.

### Consumption

The portion of GNP purchased by private households to fulfill current wants is called **consumption**. Purchases of movie tickets, food, dental work, and washing machines all fall into this category. Consumption expenditure is the largest component of GNP in most economies. In the United States, for example, the fraction of GNP devoted to consumption has fluctuated in a range from about 62 to 70 percent over the past 70 years.

### Investment

The part of output used by private firms to produce future output is called **investment**. Investment spending may be viewed as the portion of GNP used to increase the nation's stock of capital. Steel and bricks used to build a factory are part of investment spending, as are services provided by a technician who helps build business computers. Firms' purchases of inventories are also counted in investment spending because carrying inventories is just another way for firms to transfer output from current use to future use.

Investment is usually more variable than consumption. In the United States, (gross) investment has fluctuated between roughly 11 and 22 percent of GNP in recent years. We often use the word *investment* to describe individual households' purchases of stocks, bonds, or real estate, but you should be careful not to confuse this everyday meaning of the word with the economic definition of investment as a part of GNP. When you buy a share of Microsoft stock, you are buying neither a good nor a service, so your purchase does not show up in GNP.

## Government Purchases

Any goods and services purchased by federal, state, or local governments appear under **government purchases** in the national income accounts. Included in government purchases are federal military spending, government support of cancer research, and government funds spent on highway repair and education. Government purchases include investment as well as consumption purchases. Government transfer payments such as social security and unemployment benefits do not require the recipient to give the government any goods or services in return. Thus, transfer payments are not included in government purchases.

Government purchases currently take up about 18 percent of U.S. GNP, and this share has fallen somewhat since the late 1950s. (The corresponding figure for 1959, for example, was around 22 percent.) In 1929, however, government purchases accounted for only 8.5 percent of U.S. GNP.

## The National Income Identity for an Open Economy

In a closed economy, any final good or service not purchased by households or the government must be used by firms to produce new plant, equipment, and inventories. If consumption goods are not sold immediately to consumers or the government, firms (perhaps reluctantly) add them to existing inventories, thereby increasing their investment.

This information leads to a fundamental identity for closed economies. Let $Y$ stand for GNP, $C$ for consumption, $I$ for investment, and $G$ for government purchases. Since all of a closed economy's output must be consumed, invested, or bought by the government, we can write

$$Y = C + I + G.$$

We derived the national income identity for a closed economy by assuming all output is consumed or invested by the country's citizens or purchased by its government. When foreign trade is possible, however, some output is purchased by foreigners while some domestic spending goes to purchase goods and services produced abroad. The GNP identity for open economies shows how the national income a country earns by selling its goods and services is divided between sales to domestic residents and sales to foreign residents.

Since residents of an open economy may spend some of their income on imports, that is, goods and services purchased from abroad, only the portion of their spending not devoted to imports is part of domestic GNP. The value of imports, denoted by $IM$, must be subtracted from total domestic spending, $C + I + G$, to find the portion of domestic spending that generates domestic national income. Imports from abroad add to foreign countries' GNPs but do not add directly to domestic GNP.

Similarly, the goods and services sold to foreigners make up a country's exports. Exports, denoted by $EX$, are the amount foreign residents' purchases add to the national income of the domestic economy.

The national income of an open economy is therefore the sum of domestic and foreign expenditures on the goods and services produced by domestic factors of production. Thus, the national income identity for an open economy is

$$Y = C + I + G + EX - IM. \tag{2-1}$$

## An Imaginary Open Economy

To make identity (2-1) concrete, let's consider an imaginary closed economy, Agraria, whose only output is wheat. Each citizen of Agraria is a consumer of wheat, but each is also a farmer and therefore can be viewed as a firm. Farmers invest by putting aside a portion of each year's crop as seed for the next year's planting. There is also a government that appropriates part of the crop to feed the Agrarian army. Agraria's total annual crop is 100 bushels of wheat. Agraria can import milk from the rest of the world in exchange for exports of wheat. We cannot draw up the Agrarian national income accounts without knowing the price of milk in terms of wheat because all the components in the GNP identity (2-1) must be measured in the same units. If we assume the price of milk is 0.5 bushel of wheat per gallon, and that at this price, Agrarians want to consume 40 gallons of milk, then Agraria's imports are equal in value to 20 bushels of wheat.

In Table 2-1, we see that Agraria's total output is 100 bushels of wheat. Consumption is divided between wheat and milk, with 55 bushels of wheat and 40 gallons of milk (equal in value to 20 bushels of wheat) consumed over the year. The value of consumption in terms of wheat is $55 + (0.5 \times 40) = 55 + 20 = 75$.

The 100 bushels of wheat produced by Agraria are used as follows: 55 are consumed by domestic residents, 25 are invested, 10 are purchased by the government, and 10 are exported abroad. National income ($Y = 100$) equals domestic spending ($C + I + G = 110$) plus exports ($EX = 10$) less imports ($IM = 20$).

## The Current Account and Foreign Indebtedness

In reality, a country's foreign trade is exactly balanced only rarely. The difference between exports of goods and services and imports of goods and services is known as the **current account balance** (or current account). If we denote the current account by $CA$, we can express this definition in symbols as

$$CA = EX - IM.$$

**TABLE 2-1 National Income Accounts for Agraria, an Open Economy (bushels of wheat)**

| GNP (total output) | = | Consumption | + | Investment | + | Government purchases | + | Exports | − | Imports |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | = | 75[a] | + | 25 | + | 10 | + | 10 | − | 20[b] |

[a] 55 bushels of wheat + (0.5 bushel per gallon) × (40 gallons of milk).

[b] 0.5 bushel per gallon × 40 gallons of milk.

When a country's imports exceed its exports, we say the country has a *current account deficit*. A country has a *current account surplus* when its exports exceed its imports.[3]

The GNP identity, equation (2-1), shows one reason why the current account is important in international macroeconomics. Since the right-hand side of (2-1) gives total expenditures on domestic output, changes in the current account can be associated with changes in output and, thus, employment.

The current account is also important because it measures the size and direction of international borrowing. When a country imports more than it exports, it is buying more from foreigners than it sells to them and must somehow finance this current account deficit. How does it pay for additional imports once it has spent its export earnings? Since the country as a whole can import more than it exports only if it can borrow the difference from foreigners, a country with a current account deficit must be increasing its net foreign debts by the amount of the deficit. This is currently the position of the United States, which has a significant current account deficit (and borrowed a sum equal to roughly 2.3 percent of its GNP in 2019).[4]

Similarly, a country with a current account surplus is earning more from its exports than it spends on imports. This country finances the current account deficit of its trading partners by lending to them. The foreign wealth of a surplus country rises because foreigners pay for any imports not covered by their exports by issuing IOUs that they will eventually have to redeem. The preceding reasoning shows that *a country's current account balance equals the change in its net foreign wealth*.[5]

We have defined the current account as the difference between exports and imports. Equation (2-1) says that the current account is also equal to the difference between national income and domestic residents' total spending $C + I + G$:

$$Y - (C + I + G) = CA.$$

It is only by borrowing abroad that a country can have a current account deficit and use more output than it is currently producing. If it uses less than its output, it has a current account surplus and is lending the surplus to foreigners.[6] A country with a current account deficit is importing present consumption and exporting future consumption. A country with a current account surplus is exporting present consumption and importing future consumption.

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[3]In addition to net exports of goods and services, the current account balance includes net unilateral transfers of income, which we briefly discussed earlier. Following our earlier assumption, we continue to ignore such transfers for now to simplify the discussion. Later in this chapter, when we analyze the U.S. balance of payments in detail, we will see how transfers of current income enter the current account.

[4]Alternatively, a country could finance a current account deficit by using previously accumulated foreign wealth to pay for imports. This country would be running down its net foreign wealth, which has the same effect on overall wealth as running up its net foreign debts.

Our discussion here is ignoring the possibility that a country receives *gifts* of foreign assets (or gives such gifts), such as when one country agrees to forgive another's debts. As we will discuss later, such asset transfers (unlike transfers of current income) are not part of the current account, but they nonetheless do affect net foreign wealth. They appear in the *capital account* of the balance of payments.

[5]Alas, this statement is also not exactly correct because there are factors that influence net foreign wealth that are not captured in the national income and product accounts. We will abstract from this fact until this chapter's concluding Case Study.

[6]The sum $A = C + I + G$ is often called domestic *absorption* in the literature on international macroeconomics. Using this terminology, we can describe the current account surplus as the difference between income and absorption, $Y - A$.

As an example, consider again the imaginary economy of Agraria described in Table 2-1. The total value of its consumption, investment, and government purchases, at 110 bushels of wheat, is greater than its output of 100 bushels. This inequality would be impossible in a closed economy; it is possible in this open economy because Agraria now imports 40 gallons of milk, worth 20 bushels of wheat, but exports only 10 bushels of wheat. The current account deficit of 10 bushels is the value of Agraria's borrowing from foreigners, which the country will have to repay in the future.

Figure 2-2 gives a vivid illustration of how a string of current account deficits can add up to a large foreign debt. The figure plots the U.S. current account balance since the late 1970s along with a measure of the nation's stock of net foreign wealth, its **net international investment position** (or *IIP*), the difference between its claims on foreigners and its liabilities to them. As you can see, the United States had accumulated a positive stock of foreign wealth by the early 1980s, after which a sustained current account deficit of proportions unprecedented in the 20th century opened up. In 1989, the country became a net debtor to foreigners for the first time since World War I. That foreign debt has continued to grow, and at the start of 2020, it stood at about 50 percent of GNP.

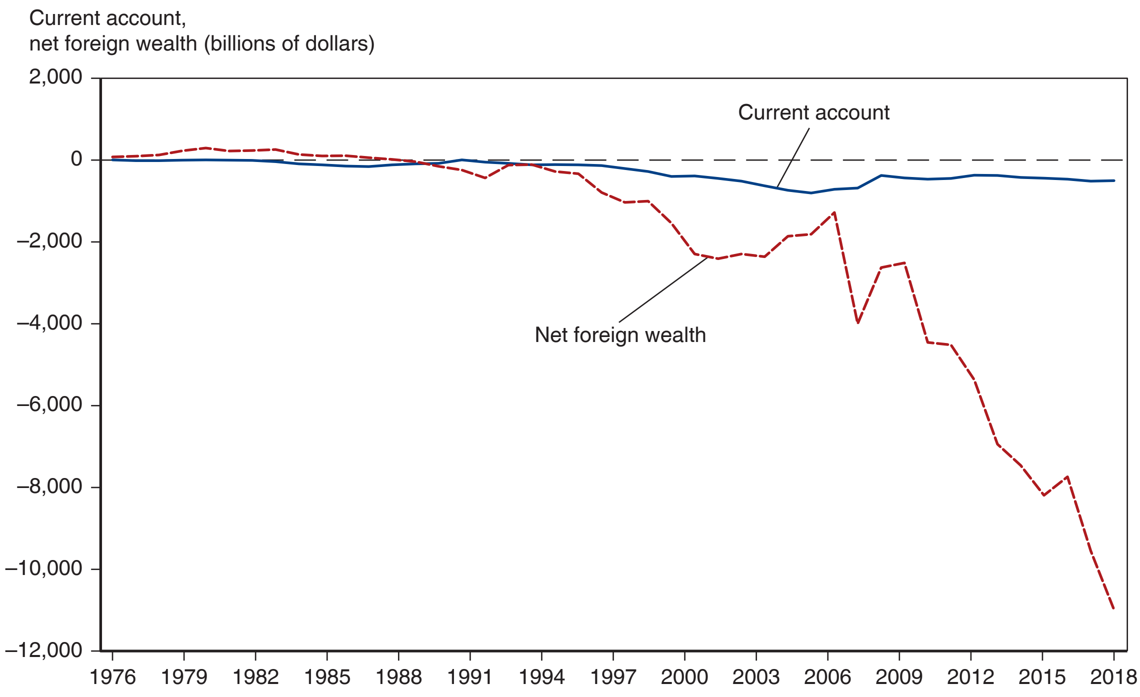



FIGURE 2-2

**The U.S. Current Account and Net International Investment Position, 1976–2019**

A string of current account deficits starting in the early 1980s reduced America's net foreign wealth until, by the early 21st century, the country had accumulated a substantial net foreign debt.

**Source:** U.S. Department of Commerce, Bureau of Economic Analysis.

## Saving and the Current Account

Simple as it is, the GNP identity has many illuminating implications. To explain the most important of these implications, we define the concept of **national saving**, that is, the portion of output, $Y$, that is not devoted to household consumption, $C$, or government purchases, $G$.[7] *In a closed economy, national saving always equals investment*. This tells us that the closed economy as a whole can increase its wealth only by accumulating new capital.

Let $S$ stand for national saving. Our definition of $S$ tells us that

$$S = Y - C - G.$$

Since the closed-economy GNP identity, $Y = C + I + G$, may also be written as $I = Y - C - G$, then

$$S = I,$$

and national saving must equal investment in a closed economy.

Whereas in a closed economy, saving and investment must always be equal, in an open economy they can differ. Remembering that national saving, $S$, equals $Y - C - G$ and that $CA = EX - IM$, we can rewrite the GNP identity (2-1) as

$$S = I + CA.$$

The equation highlights an important difference between open and closed economies: An open economy can save either by building up its capital stock or by acquiring foreign wealth, but a closed economy can save only by building up its capital stock.

Unlike a closed economy, an open economy with profitable investment opportunities does not have to increase its saving in order to exploit them. The preceding equation shows that it is possible simultaneously to raise investment and foreign borrowing without changing saving. For example, if New Zealand decides to build a new hydroelectric plant, it can import the materials it needs from the United States and borrow American funds to pay for them. This transaction raises New Zealand's domestic investment because the imported materials contribute to expanding the country's capital stock. The transaction also raises New Zealand's current account deficit by an amount equal to the increase in investment. New Zealand's saving does not have to change, even though investment rises. For this to be possible, however, U.S. residents must be willing to save more so that the resources needed to build the plant are freed for New Zealand's use. The result is another example of intertemporal trade, in which New Zealand imports present output (when it borrows from the United States) and exports future output (when it pays off the loan).

Because one country's savings can be borrowed by a second country in order to increase the second country's stock of capital, a country's current account surplus is often referred to as its *net foreign investment*. Of course, when one country lends to another to finance investment, part of the income generated by the investment in future years must be used to pay back the lender. Domestic investment and foreign investment are two different ways in which a country can use current savings to increase its future income.

[7]The U.S. national income accounts assume that government purchases do not help to enlarge the nation's capital stock. We follow this convention here by subtracting *all* government purchases from output to calculate national saving. Most other countries' national accounts distinguish between government consumption and government investment (for example, investment by publicly owned enterprises) and include the latter as part of national saving. Often, however, government investment figures include purchases of military equipment.

## Private and Government Saving

So far our discussion of saving has not stressed the distinction between saving decisions made by the private sector and saving decisions made by the government. Unlike private saving decisions, however, government saving decisions are often made with an eye toward their effect on output and employment. The national income identity can help us to analyze the channels through which government saving decisions influence domestic macroeconomic conditions. To use the national income identity in this way, we first have to divide national saving into its private and government components.

**Private saving** is defined as the part of disposable income that is saved rather than consumed. Disposable income is national income, $Y$, less the net taxes collected from households and firms by the government, $T$.[8] Private saving, denoted $S^p$, can therefore be expressed as

$$S^p = Y - T - C.$$

*Government saving* is defined similarly to private saving. The government's "income" is its net tax revenue, $T$, while its "consumption" is government purchases, $G$. If we let $S^g$ stand for government saving, then

$$S^g = T - G.$$

The two types of saving we have defined, private and government, add up to national saving. To see why, recall the definition of national saving, $S$, as $Y - C - G$. Then

$$S = Y - C - G = (Y - T - C) + (T - G) = S^p + S^g.$$

We can use the definitions of private and government saving to rewrite the national income identity in a form that is useful for analyzing the effects of government saving decisions on open economies. Because $S = S^p + S^g = I + CA$,

$$S^p = I + CA - S^g = I + CA - (T - G) = I + CA + (G - T). \tag{2-2}$$

Equation (2-2) relates private saving to domestic investment, the current account surplus, and government saving. To interpret equation (2-2), we define the **government budget deficit** as $G - T$, that is, as government saving preceded by a minus sign. The government budget deficit measures the extent to which the government is borrowing to finance its expenditures. Equation (2-2) then states that a country's private saving can take three forms: investment in domestic capital ($I$), purchases of wealth from foreigners ($CA$), and purchases of the domestic government's newly issued debt ($G - T$).[9]

### THE MYSTERY OF THE MISSING DEFICIT

Because each country's exports are other countries' imports, the world's current account balances must add up to zero. But they don't. The accompanying figure shows the pattern in the data. In all but one year between 1980 and 2003, the sum of global current accounts was negative, implying either that surpluses were understated or that deficits were overstated. But in 2004, the "mystery of the missing surplus" became a "mystery of the missing deficit." Since that year, the measured global current account has been positive.

[8]Net taxes are taxes less government transfer payments. The term *government* refers to the federal, state, and local governments considered as a single unit.

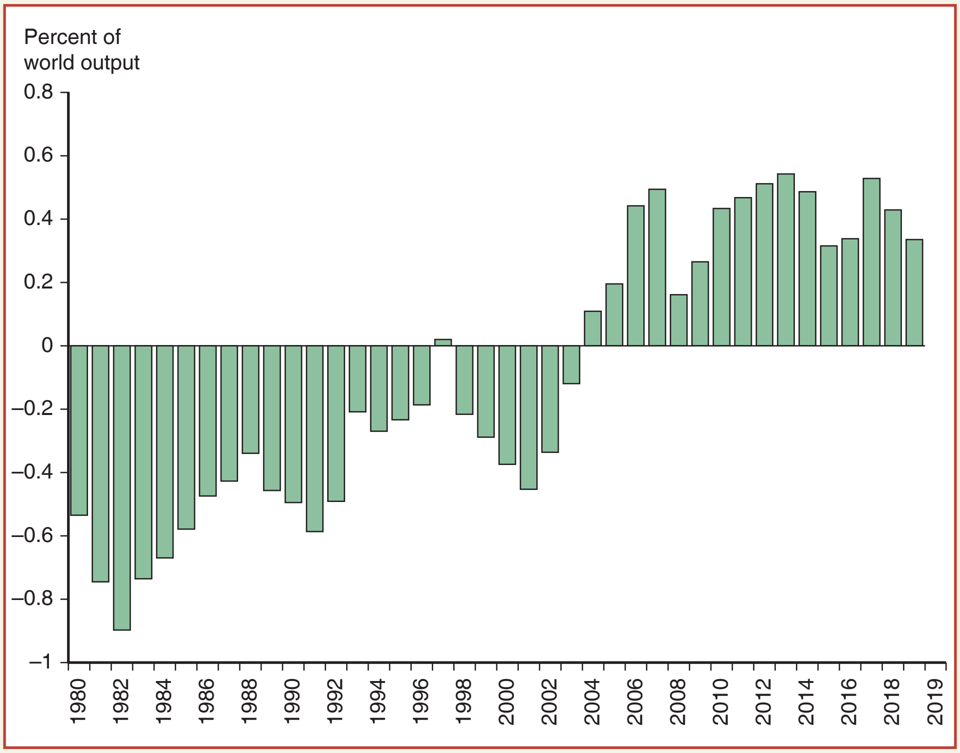
[9]In a closed economy, the current account is always zero, so equation (2-2) is simply $S^p = I + (G - T)$.

Given the inevitable errors in collecting detailed international payments data from many national agencies with differing accuracy and coverage, some discrepancy is unavoidable. What is puzzling is that the global discrepancy should be *persistently* positive or negative. That pattern suggests that something systematic is going on.

When the global current account balance was negative, it was thought that a big contributing factor was incomplete reporting of international investment income. For example, banks report these to their home governments, but the recipients, some of whom wish to avoid taxes, may not report them at the receiving end.

Not only have tax authorities become better at enforcing compliance, however, the general level of interest rates is now lower than it was in the 1980s and 1990s. Better measurement of international investment income could be responsible for a shrinking negative world current account. But what could have made it turn positive?

One possible culprit is growing international trade in services. For example, a big law firm is likely to report its service exports fairly accurately, but the purchases by many of its smaller customers may escape detection. In a detailed review of the question in 2011, however, *The Economist* magazine pointed out that errors in measuring merchandise trade have also risen dramatically, and it is less clear that these would create a systematic bias toward an apparent global surplus.[10] The mystery remains a mystery. In 2019, it was worth $290 billion, or about a third of a percent of world output.




**The Global Current Account Discrepancy since 1980**

Once big and negative, implying missing current account credits, the world's current account balance has become big and positive, implying missing current account debits.

**Source:** International Monetary Fund, *World Economic Outlook* database, October 2019.

[10]See "Economics Focus: Exports to Mars," *The Economist*, November 12, 2011, at http://www.economist.com/node/21538100.

# The Balance of Payments Accounts

In addition to national income accounts, government economists and statisticians also keep balance of payments accounts, a detailed record of the composition of the current account balance and of the many transactions that finance it.[11] Balance of payments figures are of great interest to the general public, as indicated by the attention that various news media pay to them. But press reports sometimes confuse different measures of international payments flows. Should we be alarmed or cheered by a *Wall Street Journal* headline proclaiming, "U.S. Chalks Up Record Balance of Payments Deficit"? A thorough understanding of balance of payments accounting will help us evaluate the implications of a country's international transactions.

A country's balance of payments accounts keep track of both its payments to and its receipts from foreigners. Any transaction resulting in a receipt from foreigners appears in the balance of payments accounts as a *credit*. Any transaction resulting in a payment to foreigners appears as a *debit*. Three types of international transaction are recorded in the balance of payments:

1. Transactions that arise from the export or import of goods or services and therefore enter directly into the current account. When a French consumer imports American blue jeans, for example, the transaction enters the U.S. balance of payments accounts as a credit on the current account. On the other hand, American imports of French cheese enter the U.S. balance of payments as a debit. A positive current account balance means that current account credits exceed debits and that a country's residents are exporting more goods and services to foreign residents than they are importing from them.
2. Transactions that arise from the purchase or sale of financial assets. An **asset** is any one of the forms in which people hold wealth, such as money, stocks, factories, or government debt. The **financial account** of the balance of payments records all international purchases and sales of financial assets. When an American company buys a French factory, the transaction enters the U.S. balance of payments as a debit. It enters as a debit because the transaction requires a payment from the United States to foreigners. Correspondingly, a U.S. sale of assets to foreigners enters the U.S. balance of payments as a credit. Balance of payments statistics present the financial account as debits less credits, that is, as the difference between a country's purchases and sales of foreign assets. Balance of payments accountants sometimes refer to this *financial account balance* alternatively as *net financial flows*. It is positive when, on net, a country's residents are accumulating claims on foreign residents, that is, buying more financial assets from foreign residents than are being sold to them.
3. Certain other activities resulting in transfers of wealth between countries appear in the **capital account**. These international asset movements—which are generally very small for the United States—differ from those listed in the financial account.

[11]The U.S. Bureau of Economic Analysis (BEA) has changed its balance of payments presentation to conform to prevailing international standards, so our discussion in this chapter differs in some respects from that in earlier editions of this book. We follow the new methodology described by Kristy L. Howell and Robert E. Yuskavage, "Modernizing and Enhancing BEA's International Economic Accounts: Recent Progress and Future Directions," *Survey of Current Business* (May 2010), pp. 6–20. The BEA completed the full transition to the new system in June 2014. For an update, see Jeffrey R. Bogen, Mai-Chi Hoang, Kristy L. Howell, and Erin M. Whitaker, "Comprehensive Restructuring and Annual Revision of the U.S. International Transactions Accounts," *Survey of Current Business* (July 2014), pp. 1–24.

For the most part, they result from nonmarket activities or represent the acquisition or disposal of nonproduced, nonfinancial, and possibly intangible assets (such as copyrights and trademarks). For example, if the U.S. government forgives $1 billion in debt owed to it by the government of Pakistan, U.S. wealth declines by $1 billion and a $1 billion debit is recorded in the U.S. capital account.

You will find the complexities of the balance of payments accounts less confusing if you keep in mind the following simple rule of double-entry bookkeeping: *Every international transaction automatically enters the balance of payments twice, once as a credit and once as a debit*. This principle of balance of payments accounting holds true because every transaction has two sides: If you buy something from a foreigner, you must pay him in some way, and the foreigner must then somehow spend or store your payment.

## Examples of Paired Transactions

Some examples will show how the principle of double-entry bookkeeping operates in practice.

1. Imagine you buy an ink-jet fax machine from the Italian company Olivetti and pay for your purchase with a $1,000 check. Your payment to buy a good (the fax machine) from a foreign resident enters the U.S. current account as a debit. But where is the offsetting balance of payments credit? Olivetti's U.S. salesperson must do something with your check—let's say he deposits it in Olivetti's account at Citibank in New York. In this case, Olivetti has purchased, and Citibank has sold, a U.S. asset—a bank deposit worth $1,000—and the transaction shows up as a $1,000 credit in the U.S. financial account. The transaction creates the following two offsetting bookkeeping entries in the U.S. balance of payments:

| | Credit | Debit |
|---|---|---|
| Fax machine purchase (Current account, U.S. good import) | | $1,000 |
| Sale of bank deposit by Citibank (Financial account, U.S. asset sale) | $1,000 | |

2. As another example, suppose that during your travels in France, you pay $200 for a fine dinner at the Restaurant de l'Escargot d'Or. Lacking cash, you place the charge on your Visa credit card. Your payment, which is a tourist expenditure, counts as a service import for the United States and therefore as a current account debit. Where is the offsetting credit? Your signature on the Visa slip entitles the restaurant to receive $200 (actually, its local currency equivalent) from First Card, the company that issued your Visa card. It is therefore an asset, a claim on a future payment from First Card. So when you pay for your meal abroad with your credit card, you are selling an asset to France and generating a $200 credit in the U.S. financial account. The pattern of offsetting debits and credits in this case is:

| | Credit | Debit |
|---|---|---|
| Meal purchase (Current account, U.S. service import) | | $200 |
| Sale of claim on First Card (Financial account, U.S. asset sale) | $200 | |

3. Imagine next that your Uncle Sid from Los Angeles buys a newly issued share of stock in the U.K. oil giant British Petroleum (BP). He places his order with his U.S. stockbroker, Go-for-Broke, Inc., paying $95 with funds from his Go-for-Broke money market account. BP, in turn, deposits the $95 Sid has paid into its own U.S. bank account at Second Bank of Chicago. Uncle Sid's acquisition of the stock creates a $95 debit in the U.S. financial account (he has purchased an asset from a foreign resident, BP), while BP's $95 deposit at its Chicago bank is the offsetting financial account credit (BP has expanded its U.S. asset holdings). The mirror-image effects on the U.S. balance of payments therefore both appear in the financial account:

| | Credit | Debit |
|---|---|---|
| Uncle Sid's purchase of a share of BP (Financial account, U.S. asset purchase) | | $95 |
| BP's deposit of Uncle Sid's payment at Second Bank of Chicago (Financial account, U.S. asset sale) | $95 | |

4. Finally, let's consider how the U.S. balance of payments accounts are affected when U.S. banks forgive (that is, announce that they will simply forget about) $5,000 in debt owed to them by the government of the imaginary country of Bygonia. In this case, the United States makes a $5,000 capital transfer to Bygonia, which appears as a $5,000 debit entry in the capital account. The associated credit is in the financial account, in the form of a $5,000 reduction in U.S. assets held abroad (a negative "acquisition" of foreign assets and therefore a balance of payments credit):

| | Credit | Debit |
|---|---|---|
| U.S. banks' debt forgiveness (Capital account, U.S. transfer payment) | | $5,000 |
| Reduction in banks' claims on Bygonia (Financial account, U.S. asset sale) | $5,000 | |

These examples show that many circumstances can affect the way a transaction generates its offsetting balance of payments entry. We can never predict with certainty where the flip side of a particular transaction will show up, but we can be sure that it will show up somewhere.

## The Fundamental Balance of Payments Identity

Because any international transaction automatically gives rise to offsetting credit and debit entries in the balance of payments, the sum of the current account balance and the capital account balance automatically equals the financial account balance:

$$\text{Current account balance} + \text{capital account balance} = \text{Financial account balance} \qquad \textbf{(2-3)}$$

In examples 1, 2, and 4 previously, current or capital account entries have offsetting counterparts in the financial account, while in example 3, two financial account entries offset each other. Double-entry bookkeeping tells us that a country's total receipts from foreigners must match its total payments to them. Therefore, total balance of payments credits must equal total balance of payments debits. Equation (2-3) merely rearranges that identity by gathering current (and capital) credits less debits on the left-hand side and financial debits less credits on the right-hand side.

You can understand this identity another way. Recall the relationship linking the current account to international lending and borrowing. Because the sum of the current and capital accounts is the total change in a country's net foreign assets (including, through the capital account, nonmarket asset transfers), that sum necessarily equals the difference between a country's purchases of assets from foreigners and its sales of assets to them—that is, the financial account balance.

We now turn to a more detailed description of the balance of payments accounts, using as an example the U.S. accounts for 2019.

## The Current Account, Once Again

As you have learned, the current account balance measures a country's net exports of goods and services. In practice, it also includes any net unilateral transfer payments it receives from abroad (an item we have largely ignored until now). Table 2-2 shows that U.S. exports (on the credit side) were \$3,805.94 billion in 2019, while U.S. imports (on the debit side) were \$4,286.16 billion (inclusive of unilateral transfers).

The balance of payments accounts divide exports and imports into three finer categories. The first is *goods* trade, that is, exports or imports of merchandise. The second category, *services*, includes items such as payments for legal assistance, tourists' expenditures, and shipping fees. The final category, *primary income*, consists mostly of international interest and dividend payments and the earnings of domestically owned firms operating abroad. If you own a share of a German firm's stock and receive a dividend payment of \$5, then that payment shows up in the accounts as a U.S. investment income receipt of \$5. Wages that workers earn from foreign employers can also enter as primary income.

We include income on foreign investments in the current account because that income really is compensation for the *services* provided by foreign investments. This idea, as we saw earlier, is behind the distinction between GNP and GDP. When a U.S. corporation builds a plant in Canada, for instance, the productive services the plant generates are viewed as a service export from the United States to Canada equal in value to the profits the plant yields for its American owner. To be consistent, we must be sure to include these profits in American GNP and not in Canadian GNP. Remember, the definition of GNP refers to goods and services generated by a country's factors of production, but it does *not* specify that those factors must work within the borders of the country that owns them. Before calculating the current account, we must also account for unilateral transfers, shown in the table as *secondary income*. In discussing the relationship between GNP and national income, we defined unilateral transfers between countries as international gifts, that is, payments that do not correspond to the purchase of any good, service, or asset. Net unilateral transfers are considered part of the current account as well as a part of national income, and the identity $Y = C + I + G + CA$ holds exactly if $Y$ is interpreted as GNP *plus* net transfers (equal to GNI). In 2019, the U.S. balance of unilateral transfers was \$141.98 billion $-$ \$281.69 billion $= -$\$139.71 billion.

The table shows a 2019 current account balance of \$3,805.94 billion $-$ \$4,286.16 billion $= -$\$480.22 billion, a deficit. The negative sign means that current

**TABLE 2-2 U.S. Balance of Payments Accounts for 2019 (billions of dollars)**

| | |
|---|---|
| **Current Account** | |
| (1) Exports and current transfer receipts | **3,805.94** |
| Of which: | |
| Goods | 1,652.44 |
| Services | 875.83 |
| Income receipts (primary income) | 1,135.69 |
| Current transfer receipts (secondary income) | 141.98 |
| (2) Imports and current transfer payments | **4,286.16** |
| Of which: | |
| Goods | 2,516.77 |
| Services | 588.36 |
| Income payments (primary income) | 899.35 |
| Current transfer payments (secondary income) | 281.69 |
| *Balance on current account* [(1) − (2)] | **−480.22** |
| **Capital Account** | |
| (3) | −6.24 |
| **Financial Account** | |
| (4) Net U.S. acquisition of financial assets, excluding financial derivatives | **440.75** |
| Of which: | |
| Official reserve assets | 4.66 |
| Other assets | 436.09 |
| (5) Net U.S. incurrence of liabilities, excluding financial derivatives | **797.96** |
| Of which: | |
| Official reserve liabilities | 61.63 |
| Other liabilities | 736.33 |
| (6) Financial derivatives other than reserves, net | −38.34 |
| *Net financial flows* [(4) − (5) + (6)] | −395.54 |
| **Statistical Discrepancy** | **90.92** |
| [Net financial flows less sum of current and capital accounts] | |

**Source:** U.S. Department of Commerce, Bureau of Economic Analysis, June 19, 2020, release. Totals may differ from sums because of rounding.

payments to foreigners exceeded current receipts and that U.S. residents used more output than they produced. Since these current account transactions were paid for in some way, we know that this $480.22 billion net debit entry must be offset by a net $480.22 billion credit elsewhere in the balance of payments.

## The Capital Account

The capital account entry in Table 2-2 shows that in 2019, the United States paid foreign residents about $6 billion in net capital transfers. The net balance of −$6.24 billion is a balance of payments debit. After we add it to the payments deficit implied by the current account, we find that the United States' need to cover its excess payments to foreigners is increased very slightly, from $480.22 billion to $486.46 billion.