THE ECONOMY TODAY

SIXTEENTH EDITION

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THE ECONOMY TODAY

SIXTEENTH EDITION

Bradley R. Schiller

Karen Gebhardt

Mc Graw Hill

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ABOUT THE AUTHORS

Bradley R. Schiller has more than four decades of experience teaching introductory economics at American University, the University of Nevada, the University of California (Berkeley and Santa Cruz), and the University of Maryland. He has given guest lectures at more than 300 colleges ranging from Fresno, California, to Istanbul, Turkey. Dr. Schiller's unique contribution to teaching is his ability to relate basic principles to current socioeconomic problems, institutions, and public policy decisions. This perspective is evident throughout *The Economy Today.*

Courtesy of Bradley R. Schiller

Dr. Schiller derives this policy focus from his extensive experience as a Washington consultant. He has been a consultant to most major federal agencies, many congressional committees, political candidates, and presidents. In addition, he has evaluated scores of government programs and helped design others. His studies of poverty, discrimination, training programs, tax reform, pensions, welfare, Social Security, and lifetime wage patterns have appeared in both professional journals and popular media. Dr. Schiller is also a frequent commentator on economic policy for television and radio, and his commentary has appeared in *The Wall Street Journal, The Washington Post, The New York Times,* and *Los Angeles Times,* among other major newspapers.

Dr. Schiller received his Ph.D. from Harvard and his B.A. degree, with great distinction, from the University of California (Berkeley). On his days off, Dr. Schiller is on the tennis courts, the ski slopes, or the crystal-blue waters of Lake Tahoe.

Dr. Karen Gebhardt is a faculty member in the Department of Economics and is the Director of the Online Economics Program at the University of Colorado Boulder. Dr. Gebhardt has a passion for teaching economics. She regularly instructs courses in all modalities (online, on campus, hybrid, remote) from introductory courses in macro- and microeconomics, to upper-division courses in microeconomics, international trade, and managerial economics and graduate courses in environmental economics and public finance.

Courtesy of Karen Gebhardt

She is an early adopter of teaching with technology and advocates strongly for it because she sees the difference it makes in student engagement and learning. Dr. Gebhardt was the recipient of the Water Pik Excellence in Education Award in 2006 and was awarded the Best Teacher Award in 2015 while she was at Colorado State University.

Dr. Gebhardt's research interests, publications, and presentations involve the economics and online education and the economics of human–wildlife interaction. Before returning to academia, she worked as an economist at the U.S. Department of Agriculture/Animal and Plant Health Inspection Service/Wildlife Services/National Wildlife Research Center, conducting research related to the interactions of humans and wildlife. Her current research focuses on using data to improve student learning outcomes in economics education with an emphasis on improving grades and completion rates in online courses.

In her free time, Dr. Gebhardt enjoys learning about new teaching methods that integrate technology and going rock climbing and camping in the Colorado Rockies and beyond.

PREFACE

CURRENT, POLICY FOCUSED, READABLE

Current

Every edition of *The Economy Today* has offered a level of currency that no other text has matched. Maintaining that front-page advantage has been particularly important to this edition. First and foremost is the integration of the coronavirus pandemic into the narrative. The pandemic – and the responses to it – changed the behavior and performance of economies around the world. Among other things, the pandemic prompted breathtaking expansions in the scope and magnitude of fiscal and monetary policy options. It also focused more attention on the supply side of the economy, especially the potential for external shocks to shut down production. In micro, we have seen how the pandemic changed both consumer and producer behavior – and wreaked havoc on domestic and international financial markets. The pandemic also changed political priorities, contributing to President Biden's 2020 Election. This edition examines those developments and their implications for ongoing policy and personal decision-making. This 16th edition offers the latest data on U.S. economic performance, global comparisons, policy initiatives, court cases, and political controversies over economic policy and priorities. Among the more visible updates are the following:

Policy Focused

The Economy Today was one of the first economics textbooks to supplement the narrative with boxed illustrations of institutional and policy applications of core concepts. The goal has always been to help students see the relevance of studying economics to themselves and the world around them. Schiller and Gebhardt make sure students understand the challenges of economic policy and the consequences of specific actions like tariffs, regulation, and tax reform. They provide a balanced discussion of these issues, allowing students to recognize and assess different perspectives on critical issues. This Policy focus is reinforced by (a) attaching explanatory captions to every boxed insert, (b) referencing all of the boxed material in the body of the text, and (c) referencing the boxed material in end-of-chapter discussions questions and problems. Even the photos are captioned, to assure that students see their relevance.

Front Page Economics. The *Front Page Economics* boxes are used to illustrate domestic applications of core concepts that make economics ever more relevant today. Student-focused examples cover everything from Starbucks price hikes, COVID-19 externalities, antitrust lawsuits, and Disney+ subscription pricing to the CARES Act and Mike Trout's $426 million baseball contract. Some of the 34 new *Front Page Economics* stories are:

In Intro chapters:

- "COVID-19 Cases Surpass 1 Million," in Chapter 4, illustrates externalities.

In Macro:

- "Congress OKs $2 Trillion Aid Package," in Chapter 11, describes CARES fiscal tools.
- "Fed Slashes Rates to Zero," in Chapter 14, highlights monetary stimulus.

In Micro:

- "Risky Business: Start-ups Face High Failure Rates," in Chapter 22, emphasizes entrepreneurial risk.
- "Streaming Wars Heat Up," in Chapter 25, illustrates how competition evolves.
- "Taxes: Bernie vs. Biden," in Chapter 33, showcases the difference between nominal and effective tax rates.

World View. The *World View* boxes focus on global illustrations of core concepts that allow students to see economics in action beyond U.S. borders to help them become an educated global citizen. Among the 31 new *World View* boxes in this edition are:

In Intro chapters:

- "Venezuela's Food Crisis," in Chapter 3, illustrates how price controls cause market shortages.

In Macro chapters:

- "GDP and Happiness," in Chapter 5, contrasts per capita income and well-being.
- "Budget Imbalances Common," in Chapter 12, shows deficits in other nations.
- "Zimbabwe Raises Key Interest Rate to 70%," in Chapter 15, illustrates real vs. nominal interest rates.

In Micro chapters:

- "Tesla Starts Rolling Out Cars from Shanghai Gigafactory," in Chapter 21, highlights investment vs. production decisions.
- "Nations Scrambling to End Oil-Price War," in Chapter 25, emphasizes the need for coordination in oligopoly.
- "JetBlue Looks to London," in Chapter 27, describes how landing slots are an entry barrier.

Decisions for Tomorrow. At the end of every chapter, students are challenged to use critical thinking skills to apply core concepts to a real-world phenomenon. The challenges may relate to public policy issues or life situations. All of these provocative questions not only challenge students to apply critical thinking but also to recognize the relevancy of core principles to the real world. All of the *Decisions* are posed as questions to encourage classroom discussion. Among the *Decisions* challenges in this edition are:

- "What Is the Cost of Going Green?," in Chapter 1, explores opportunity costs.
- "Is the World Ready for Libra?," in Chapter 13, examines the nature of money.
- "Do 'Influencers' Really Matter?," in Chapter 19, questions how consumers make decisions.
- "$29 AirPods?," in Chapter 23, emphasizes the power of competition to drive innovation and prices.
- "Do We Need a Billionaire's Tax?," in Chapter 33, examines the pros and cons of taxation.
- "Who Wins Trade Wars?," in Chapter 35, looks at the impacts of trade wars.

Questions for Discussion. End-of-chapter questions are common in textbooks. What distinguishes the *questions* in *The Economy Today* is their explicit integration with the core narrative and the boxed features in each chapter. There are 80 new questions in this 16th edition.

Problems. *Problems* are also provided at the end of each chapter. Like the *Questions for Discussion*, the *Problems* are closely integrated with chapter material and often require the student to review a boxed feature and apply data contained therein. There are 227 new problems (!) in this 16th edition.

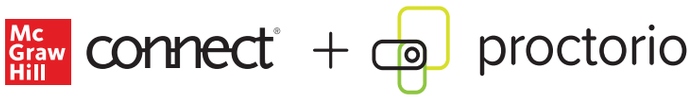
Readable

The one adjective invariably used to describe *The Economy Today* is "readable." Professors often express a bit of shock when they realize that students actually enjoy reading the text. The writing style is lively and issue-focused. Unlike any other text on the market, every boxed feature, every graph, and every table is explained and analyzed. Every feature is also referenced in the text, so students actually learn the material rather than skipping over it. Because readability is ultimately in the eye of the beholder, you might ask a couple of students to read and compare a parallel chapter in *The Economy Today* and in another text. This is a test *The Economy Today* usually wins.

Robust Integration with Connect

Connect is designed to support teaching and learning goals through providing graded and ungraded activities that can be integrated into a lecture, or assigned as part of a discussion board or problem set. Activities such as assignable discussion, graphing, and algorithmic problems; interactive graphs; and videos make it easy to enhance learning with just a few clicks. One unique feature of this text is that Schiller and Gebhardt personally have created the text-specific Connect content, leveraging their combined 60 years of teaching undergraduate face-to-face, online, hybrid, and remote courses to help you improve *your* students' learning. The author team assures that the text and all supplemental materials are harmonized and robustly integrated with Connect, providing peace of mind for both the professor and students.

Remote Proctoring & Browser-Locking Capabilities



New remote proctoring and browser-locking capabilities, hosted by Proctorio within Connect, provide control of the assessment environment by enabling security options and verifying the identity of the student.

Seamlessly integrated within Connect, these services allow instructors to control students' assessment experience by restricting browser activity, recording students' activity, and verifying students are doing their own work.

Instant and detailed reporting gives instructors an at-a-glance view of potential academic integrity concerns, thereby avoiding personal bias and supporting evidence-based claims.

CHAPTER-BY-CHAPTER CHANGES: PURPOSE, APPROACH, AND UPDATES

Every chapter of this edition has been thoroughly reviewed and subjected to careful revision, editing, and updating. The following paragraphs provide a quick overview of each chapter and a list of the most notable updates.

Intro Chapters. Chapter 1: Economics: The Core Issues introduces the core issues of What, How, and For Whom goods and services are produced. It also highlights debates of how those decisions are made—by free markets, by governments, or by some mix of both. The intent is to give students a sense that "the economy" is not an abstract phenomenon but instead a vital determinant of our collective well-being. Heritage Organization "free market" 2020 rankings illustrate how different economies are structured and global military spending levels illustrate some of the "guns vs. butter" outcomes that result. A new "Decisions for Tomorrow" feature highlights the goals and trade-offs of the "Green revolution."

Chapter 2: The U.S. Economy: A Global View is uniquely designed to give students an empirical perspective on the dimensions of the U.S. economy—specifically, what we produce, how we produce, and for whom we produce. Within each of these dimensions, comparisons are provided to the rest of the world, giving students a truly global view of how the U.S. economy stacks up. This is a critical foundation for informing students about the economic world we want them to understand.

Chapter 3: Supply and Demand introduces the core elements of the market mechanism. It does this in a much more empirical context, however, than most texts. Illustrations include a Front Page Economics story on the pricing of Disney+ subscriptions, a World View on the supply shifts due to the 2019 missile attacks on Saudi oil fields, a World View on Venezuelan price controls, and a discussion of how the coronavirus pandemic prompted alleged price gouging. The end-of-chapter Decisions for Tomorrow feature confronts students with the deadly consequences of prohibiting the purchase and sale of human organs.

Chapter 4: The Role of Government focuses on the justifications for government intervention and the institutions—federal, state, and local—that have been developed to perform those functions. The chapter not only details the scope of government(s) but also looks at public perceptions about how well the public sector performs. A World View on Israel's "Iron Dome" missile defense (a public good), a Front Page Economics on vaping bans (externalities), and a Front Page Economics on public confidence in government enliven the discussion. The end-of-chapter Decisions for Tomorrow feature highlights the shortcomings of collective decision making, including public choice theory.

Macro Chapters. Chapter 5: National Income Accounting emphasizes the circularity of output and income flows while highlighting their relevance to policy decisions. The contrast between economic and social indices of well-being are discussed and illustrated with a new World View on global happiness rankings. Another World View contrasts specific dimensions of our living standards with those of poorer nations—a comparison that adds real substance to cross-country statistical GDP comparisons.

Chapter 6: Unemployment not only introduces the standard measures of unemployment but also illustrates the socioeconomic costs of that macro failure. The spike in joblessness caused by the coronavirus helps illustrate the differences between jobless and unemployment measures. The Decisions for Tomorrow feature on "Is Outsourcing Really Bad?" discusses the motivations and consequences of President Trump's campaign against outsourcing.

Chapter 7: Inflation not only describes how inflation is measured but, importantly, discusses the socioeconomic costs of rising price levels. A World View on the Venezuelan bolivar underscores the destructive force of runaway inflation.

Chapter 8: The Business Cycle is the starting point for macro theory. The intent of this chapter is to describe the nature of business cycles, review their history, and preview some of the salient theories about their origins. The aggregate demand/aggregate supply model is also introduced in this chapter as a common framework for illustrating and contrasting different perspectives on macro (in)stability. The coronavirus pandemic serves as a timely illustration of how external shocks can derail an economy.

Chapter 9: Aggregate Demand focuses on the nature and building blocks of the aggregate demand curve. The novelty of this presentation is the construction of the AD curve with horizontal rather than vertical increments $[C + I + G + (X - M)]$, a nuance that greatly facilitates later illustrations of the income multiplier. Front Page Economics stories about the 2019/2020 wealth effects of a (then-)rising stock market and another about the March 2020 reversal of the leading economic indicators add real-world flavor.

Chapter 10: Self-Adjustment or Instability? confronts the central question of whether laissez-faire economies self-adjust or not. The multiplier is introduced—and illustrated in the context of the AD/AS model with sequential, horizontal shifts of the AD curve. This novel approach is much more intuitive than the traditional Keynesian-cross approach and lends itself to simple mathematical and graphical exercises. Data on the variability of consumer and investor spending help illustrate the potential for macro instability.

Chapter 11: Fiscal Policy examines the potential of tax, spending, and transfer policies to shift the AD curve in desired directions. The unique interpretation of Keynesian theory in the context of the AD/AS model permits the illustration of both output and price-level effects of fiscal interventions. Explicit, mathematical guidelines for designing fiscal interventions are derived. And, of course, the chapter examines the impact of the 2017 tax cuts and the 2020 coronavirus recovery rebates, and the massive increase in unemployment-benefit transfers.

Chapter 12: Deficits and Debt describes the nature, origins, history, and consequences of federal budget deficits and the resulting national debt. The distinction between cyclical and structural deficits is emphasized. Global comparisons of debt/GDP ratios are provided along with information about the ownership of the debt. The 2019–2021 suspension of the debt ceiling and the impact of the coronavirus stimulus package are discussed.

Chapter 13: Money and Banks focuses on the nature and origins of what we call "money," then explains why money is so critical to the functioning of any economy. The content and purpose of T-accounts are carefully explained, as is the process of money creation. Data on the structure of interest rates help illustrate the price of holding money. The Decisions for Tomorrow feature examines the potential of Facebook's Libra or other cryptocurrencies to displace traditional money.

Chapter 14: The Federal Reserve System starts by introducing Jerome Powell and the structure of the Fed. It then describes each of the Fed's major policy tools and illustrates how each can be used. A World View on China's reserve-requirement cuts helps illustrate the use of monetary tools and creates a nice mathematical exercise. The critical role of bond markets in open-market operations is carefully described—and illustrated with a new Front Page Economics on bond-market gyrations. The Decisions for Tomorrow feature examines the potential of crowdfunding to bypass traditional banks.

Chapter 15: Monetary Policy reviews the tools of monetary policy and illustrates their potential for altering macro outcomes, contrasting Keynesian and Monetarist views in the process. The chapter also discusses the constraints on policy impact and highlights the velocity of money as a critical arbiter of effectiveness. Last, but far from least, the chapter reviews and assesses recent Fed policy, including its "whatever it takes" response to the coronavirus pandemic.

Chapter 16: Supply-Side Policy: Short-Run Options emphasizes that demand-focused policies are not the only game in town—that the AS curve is also a critical determinant of macro outcomes. The chapter starts by looking at different opinions about the shape of the AS curve, and then delves into factors and policy tools that can shift the AS curve. The elasticity of supply and its determinants are highlighted. The impact of the coronavirus, tariffs, and tax cuts on the AS curve are all discussed.

Chapter 17: Growth and Productivity: Long-Run Possibilities takes a longer view of economic growth. It looks at global growth experiences, and then examines how savings, productivity advance, population dynamics, and public policy choices affect growth trajectories. The Decisions for Tomorrow feature asks whether limitless growth is possible—or even desirable.

Chapter 18: Theory versus Reality is a unique capstone chapter that offers students a review and synthesis of central macro concepts. It summarizes the basic tools of fiscal, monetary, and supply-side policy; reviews their usage in recent years; and examines the macro performance that resulted. An extended discussion of the obstacles that constrain policy effectiveness helps explain the gap between theoretical potential and economic reality. Students love this chapter.

Micro Chapters. **Chapter 19: Consumer Choice** introduces consumer choice by first contrasting sociopsychiatric and economic explanations of consumer behavior, thereby highlighting the differences between the desire for goods and the demand for goods. Utility theory, consumer surplus, price discrimination, and consumer choice are all covered. The Decisions for Tomorrow feature looks at how "influencers" affect consumer choices.

Chapter 20: Elasticity explores price, income, and cross-price elasticities with illustrations of Netflix price hikes, iPhone sales, and California's increased tax on cigarettes. The Decisions for Tomorrow feature ponders how falling gasoline prices will affect consumers' demand for electric vehicles.

Chapter 21: The Costs of Production introduces students to the supply side of markets. The production function is discussed in detail, emphasizing the embryotic relationship between productivity and cost measures. Changes in ATC are illustrated with the volume of Uber rides, and economies of scale are illustrated with a World View on Tesla's Shanghai gigafactory. The Decisions for Tomorrow feature examines the substance of President Trump's accusation of "unfair" competition from foreign producers.

Chapter 22: The Competitive Firm starts by looking at the nature of profits and public (mis)perceptions about their scope and origins. It then illustrates the spectrum of market power, ranging from the perfectly competitive firm to monopoly. With this foundation, the

chapter proceeds to examine the production decisions of perfectly competitive firms in the context of static equilibrium. Front Page Economics on start-up failure rates, public views of profits, and corporate shutdown decisions provide illustrative context.

Chapter 23: Competitive Markets is a unique, second chapter on competition that focuses on the dynamics of competitive markets—the heart and soul of market economies. The core story traces the evolution of the personal computer industry from the original Apple 1 to the latest iPhone. The emphasis is on how the profit motive drives innovation, entry, cost reductions, price cuts, and even exit in low-barrier markets. The Decisions for Tomorrow feature applies these insights to the current competition in AirPods.

Chapter 24: Monopoly takes students to the other end of the market structure spectrum and shows how monopoly decision making and outcomes differ from those of perfect competition. A unique, step-by-step contrast of behavior patterns drives the message home. The 2020 Justice Department suit against Live Nation and the continuing EU antitrust actions against Google should spark student interest.

Chapter 25: Oligopoly starts by showing how common oligopoly is in familiar product markets, using product-specific concentration ratios found in no other text. This empirical base is followed by an analysis of how oligopolies would like to behave (replicating monopoly outcomes), the mechanisms they use in pursuit of that goal, and the obstacles they confront. Front Page Economics on the ongoing streaming wars, the 2020 oil-price war, the T-Mobile–Sprint merger, and Dr Pepper's "Fansville" ad campaign enliven the theoretical analysis. The Decisions for Tomorrow feature examines recent proposals to break up Big Tech companies.

Chapter 26: Monopolistic Competition stresses the unique structure, behavior, and outcomes of this common industry structure. Data on brand values and ad spending underscore the importance of product differentiation in monopolistic competition. The Front Page Economics on the latest Starbucks price hike illustrates the low price elasticity of demand that brand loyalty creates. The Decisions for Tomorrow feature considers proposals for requiring truth in advertising.

Chapter 27: Natural Monopolies: (De)Regulation? goes beyond the depiction of this unique industry structure to explore the regulatory dilemmas that result. Quite simply, how can regulators compel natural monopolies to deliver the benefits of economies of scale without stifling innovation and productivity advance? And how much will regulation cost? These questions are illustrated in the trucking, airline, cable, and electricity industries. A World View on landing rights at Heathrow airport highlights the importance of entry barriers in sheltering natural monopolies from potential competition.

Chapter 28: Environmental Protection addresses one of the world's greatest challenges—namely, saving the planet. The role of market incentives in both environmental degradation and, potentially, environmental protection is emphasized. Also discussed are the pros and cons of several nonmarket approaches. Front Page Economics on pollution-induced deaths, the 2021 closing of New York's nuclear plant, and California's cap-and-trade program enliven the discussion. The Decisions for Tomorrow feature assesses the costs of the Green New Deal.

Chapter 29: The Farm Problem looks at the unique circumstances of the farm sector that have motivated government interventions. Low price and income elasticities combine with the vagaries of the weather to keep farm prices and incomes volatile. The history of farm incomes and subsidies is depicted, including a summary of the 2018 Farm Act. A World View on the U.S.–China trade war points to another source of income instability on the farm.

Chapter 30: The Labor Market analyzes the determinants of labor demand and supply, and then shows how they interact to set market wages and employment levels. The issues of wage inequality and minimum wage floors are discussed at length. A critical distinction between *effective* and *ineffective* legislated wage hikes helps resolve empirical disputes. Front Page stories on Amazon's Career Day, Mike Trout's $426 million baseball contract, and the proposed "Raise the Wage Act" drive home the relevance of this chapter. The Decisions feature examines proposals for capping CEO pay.

Chapter 31: Labor Unions looks at the character, history, and prevalence of labor unions. The core of the chapter focuses on union wage/employment goals and their strategies for achieving them. Monopsonist strategies are also described and the parameters of collective bargaining established. A Front Page Economics on the 2019 UAW strike against GM illustrates the breadth of bargaining issues.

Chapter 32: Financial Markets emphasizes the economic function of financial markets in reallocating resources to new ventures and products. The stock, bond, and venture-capital markets are all analyzed. Examples range from the financing of Columbus's expedition to the Uber IPO. Stock market data on Apple, Google, and Uber are used to illustrate risk and present values.

Chapter 33: Taxes: Equity versus Efficiency sheds critical light on continuing debates about tax policy. The discussion begins with a look at the U.S. pre-tax and post-tax distributions of income. Actual tax burdens are illustrated with the tax returns of Joe Biden and Bernie Sanders (President Trump declined to provide his tax returns for this analysis) and 2020 tax brackets. Trump's tax cuts and Biden's proposed tax hikes are reviewed. The Decisions feature assesses billionaires' tax proposals.

Chapter 34: Transfer Payments: Welfare and Social Security focuses on the second tool of income redistribution. The discussion emphasizes the same trade-off between equity and efficiency that permeates tax policy. Welfare and social security illustrations showcase implicit marginal tax rates and their impact on labor-supply behavior.

International Chapters. Chapter 35: International Trade not only explains the theory of comparative advantage but also examines the opposition to free trade and the trade barriers that result. President Trump's trade wars with China and his national security argument about TikTok are discussed, followed by a Decisions feature on "Who Wins Trade Wars?" The USMCA is reviewed, as are the latest data on trade flows. World Views on the dumping of Korean cigarettes and competition from wine imports and a Front Page Economics on the cost of sugar quotas keep the discussion lively.

Chapter 36: International Finance goes beyond the mechanics of exchange-rate determination to identify the gainers and losers from exchange-rate fluctuations. A World View on the effects of the 2014–2020 appreciation of the U.S. dollar helps illustrate those redistributive effects (and the opposition thereto). The collapse of the Venezuelan bolivar adds further insight. A World View on the weakest global currencies is insightful as well.

Chapter 37: Global Poverty draws attention to the persistent depravation that still afflicts nearly 40 percent of the world's population. The discussion begins with a comparison of U.S. poverty thresholds with official global poverty measures. A survey of global poverty incidence is followed by an analysis of causation and potential remedies.

Student Problem Set

We firmly believe that students must *work* with key concepts in order to really learn them. Weekly homework assignments are *de rigueur* in our own classes. To facilitate homework assignments, we have prepared the student problem set at the end of each chapter. These sets include built-in numerical and graphing problems that build on the tables, graphs, and boxed material that align with each chapter's learning objectives. Students cannot complete all the problems without referring to material in the chapter. This increases the odds of students actually *reading* the chapter, the tables, and the boxed applications.

The student problem set at the end of each chapter is reproduced in Connect. This really helps students transition between the written material and online supplements. It also means that the online assignments are totally book-specific.

NEW AND IMPROVED SUPPLEMENTS

The following ancillaries are available for quick download and convenient access via the Instructor Resource material available through McGraw-Hill Connect: PowerPoint Presentations, Accessible PowerPoint Presentations, Instructor's Manual, Solution's Manual, and Test Builder Access.

ACKNOWLEDGMENTS

This 16th edition of *The Economy Today* represents a continuing commitment to disseminate the core principles of economics to a broad swath of college students.

Like earlier editions, it has benefited greatly from the continuing stream of ideas and suggestions from both instructors and students. For all that feedback we are most grateful. Among those who have contributed to this and prior editions are the following instructors:

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—Bradley R. Schiller

—Karen Gebhardt

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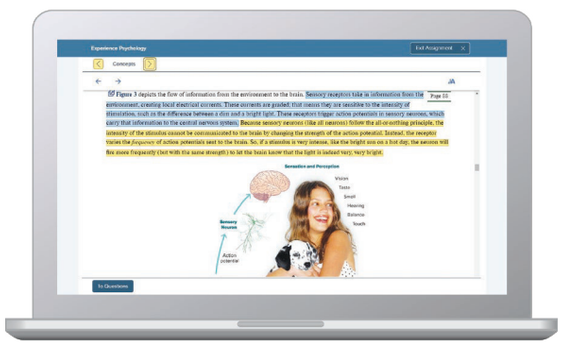

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Connect Economics Asset Alignment with Bloom's Taxonomy

Schiller/Gebhardt The Economy Today 16e

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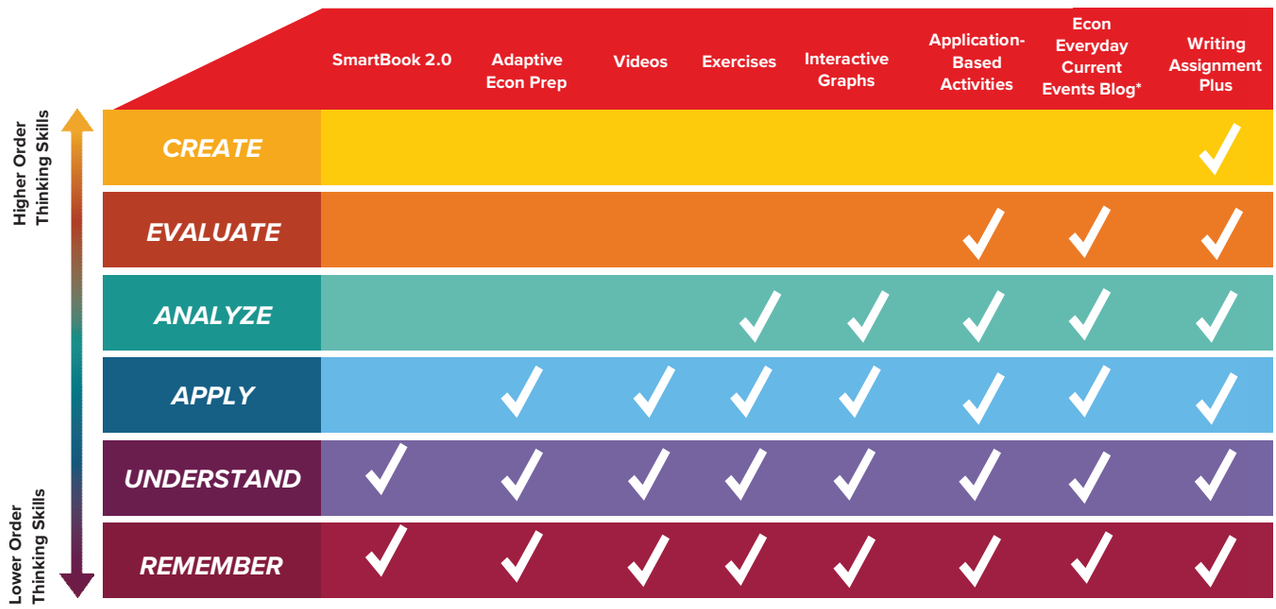

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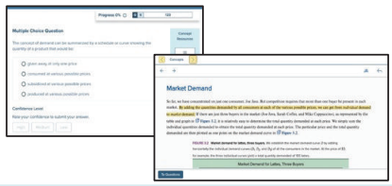

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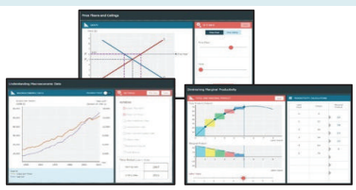

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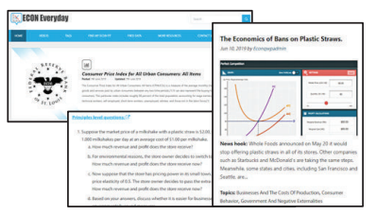

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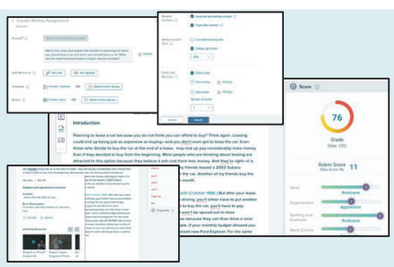

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THE ECONOMIC CHALLENGE

People in Equatorial Guinea want more food, better shelter, and access to safe drinking water. Will they get it? That depends on how well their economy grows and how the fruits of economic growth are distributed. The same is true for middle-class Americans. We want better homes, newer cars, stylish clothes, the latest tech toys, more exotic vacations, and effective vaccines. Will we get these things? Again, that depends on how well the economy grows and how the fruits of economic growth are distributed.

These first few chapters look at what "the economy" is and how it grows. What are the *limits* to the production of goods and services? How does the interplay of market forces and government policy determine how much output will actually be produced and who will get it? How does a nation's capacity to produce goods and services *increase*—so that we can have *more* of the things we want? How will those goods be distributed?

"The Economist in Chief"
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CHAPTER 1

Economics: The Core Issues

LEARNING OBJECTIVES

After reading this chapter, you should know

- **LO1-1** What scarcity is.
- **LO1-2** How scarcity creates opportunity costs.
- **LO1-3** What the production possibilities curve represents.
- **LO1-4** The three core economic questions that every society must answer.
- **LO1-5** How market and government approaches to economic problems differ.

People understand that the president of the United States is the Commander in Chief of the armed forces. The president has the ultimate responsibility to decide when and how America's military forces will be deployed. He issues the orders that military officers must carry out. He is given credit for military successes and blame for military failures. He can't "pass the buck" down the line of command.

Less recognized is the president's role as "Economist in Chief." The president is held responsible not just for the *military* security of the United States, but for its *economic* security as well. Although he doesn't have the command powers in the economic arena that he has in the military arena, people expect him to take charge of the economy. They expect the Economist in Chief to keep the economy growing, to create jobs for everyone who wants one, and to prevent prices from rising too fast. Along the way, they expect the Economist in Chief to protect the environment, assure economic justice for all, and protect America's position in the global economy.

That is a tall order, especially in view of the president's limited constitutional powers to make economic policy decisions. The president can propose tax changes, spending priorities, and international trade deals, but the U.S. Congress must approve those policies. The economy is also buffeted by international and natural forces that no president can control. This was abundantly clear in 2020 when the "invisible enemy" of COVID-19 attacked the U.S. and derailed an otherwise prosperous economy. But no matter. Voters hold the Economist in Chief responsible for economic misfortunes, whether or not he is able to single-handedly prevent them, and give him credit for economic success.

What everyone ultimately wants is a prosperous and growing economy: an economy in which people can find good jobs, enjoy rising living standards and wealth, get the education they desire, and enjoy an array of creature comforts. And we want to enjoy this good life while protecting the environment, caring for the poor, and pursuing world peace.

How are we going to get all this? Is "the economy" some sort of perpetual motion machine that will keep churning out more goods and services every year? Clearly not. During the Great Recession of 2008–2009, the economy churned out less output, eliminated jobs, and reduced living standards and wealth. A lot of college graduates had to move back home when they couldn't find jobs. What went wrong?

Even after the Great Recession ended in June 2009, economic pain persisted. The growth of the economy was agonizingly slow, and unemployment remained high for another six years. Was that much distress really necessary? Couldn't the Economist in Chief have fixed these

problems? These questions were debated intensely in the 2016 presidential election. Donald Trump promised "to make America great again" by creating more jobs, building more bridges and roads, strengthening the armed forces, and limiting both illegal immigration and unfair foreign competition. Voters decided to give him the opportunity to serve as an Economist in Chief.

The 2020 elections were largely a referendum on President Trump's performance as Economist in Chief. Voters gave Trump high marks for the growth of the economy during his first three years in office. Millions of new jobs had been created, incomes were up, wages were higher, and unemployment had fallen to record lows. Unfortunately, the coronavirus pandemic that swept across the world in early 2020 wiped out nearly all of those prior gains. In November 2020 the U.S. economy was still struggling to regain its footing: millions of Americans were still out of work, incomes were depressed, and people were fearful of a COVID-19 resurgence. They decided to vote for a new Economist in Chief.

The challenge for President Biden is to accelerate the economic recovery, while assuring people that the U.S. is well prepared to deal with any future viral attacks.

To succeed requires a knowledge of what makes an economy tick. How are prices, wages, employment, and other economic outcomes actually determined? Does Wall Street run the system? How about selfish, greedy capitalists? The banks? Or maybe foreign nations? Are incompetent bureaucrats and self-serving politicians the root of our occasional woes? Who, in fact, calls the shots?

The goal of this course is to understand how the economy works. To that end, we want to determine how *markets*—the free-wheeling exchange of goods and services—shape economic outcomes—everything from the price of this text to the national unemployment rate. Then we want to examine the role that government can and does play in (re)shaping economic performance. Do we need the government to assure adequate wages, fair prices, access to health care, or equal educational opportunities? Or can market forces alone give us these desirable outcomes? Once we've explored these issues, we'll be in a better position to evaluate what the Economist in Chief *can* do—and what he *should* do. We'll also better understand how we can make better economic decisions for ourselves.

Limited Resources

We'll start our inquiry with some harsh realities. In a world of unlimited resources, we could have all the goods we desired. We'd have time to do everything we wanted and enough money to buy everything we desired. We could produce enough to make everyone rich while protecting the environment and exploring the universe. The Economist in Chief could deliver everything voters asked for. Unfortunately, we don't live in that utopia: **We live in a world of limited resources.** Those limits are the root of our economic problems. They force us to make difficult decisions about how *best* to use our time, our money, and our resources. These are *economic* decisions.

In this first chapter, we'll examine how the problem of limited resources arises and the kinds of choices it forces us to make. As we'll see, **three core choices confront every nation:**

- **WHAT to produce with our limited resources.**
- **HOW to produce the goods and services we select.**
- **FOR WHOM goods and services are produced—that is, who should get them.**

We also have to decide who should answer these questions. Should people take care of their own health and retirement, or should the government provide a safety net of health care and pensions? Should the government regulate airfares or let the airlines set prices? Should Microsoft decide what features get included in a computer's operating system, or should the government make that decision? Should Facebook decide what personal information is protected, what posts should be permitted, or which ads can be targeted, or should the government make those decisions? Should interest rates be set by private banks alone, or should the government try to control interest rates? The battle over *who* should answer the core questions is often as contentious as the questions themselves.

THE ECONOMY IS US

To learn how the economy works, let's start with a simple truth: *The economy is us.* "The economy" is simply an abstraction referring to the grand sum of all our production and consumption activities. What we collectively produce is what the economy produces; what we collectively consume is what the economy consumes. In this sense, the concept of "the economy" is no more difficult than the concept of "the family." If someone tells you that the Jones family has an annual income of $42,000, you know that the reference is to the collective earnings of all the Joneses. Likewise, when someone reports that the nation's income is $22 trillion per year—as it now is—we should recognize that the reference is to the grand total of everyone's income. If we work fewer hours or get paid less, both family income *and* national income decline.

The same relationship between individual behavior and aggregate behavior applies to specific outputs. If we as individuals insist on driving cars rather than taking public transportation, the economy will produce millions of cars each year and consume vast quantities of oil. If we prefer to stream movies rather than watch them in theaters, then the economy will build fewer theaters and expand streaming services. If more consumers choose plant-based burgers rather than beef burgers, then cattle farms will shrink and plant processing expands. We also make choices on a collective level. We "produce" over $700 billion of national defense (e.g., military personnel, ships, planes, etc.) every year. This is a *choice* we make. If we want a different outcome, then we have to make a different choice. In each case, the output of the economy reflects the collective behavior of the 340 million individuals who participate in the U.S. economy.

We may not always be happy with the output of the economy, but we can't ignore the link between individual action and collective outcomes. If the highways are clogged and the air is polluted, we can't blame someone else for the transportation choices we made.

SCARCITY: THE CORE PROBLEM

Although we can change economic outcomes, we can't have everything we want. If you go to the mall with $20 in your pocket, you can buy only so much. The money in your pocket sets a *limit* to your spending.

The output of the entire economy is also limited. The limits in this case are set not by the amount of money in people's pockets, but by the resources available for producing goods and services. Everyone wants more housing, new schools, better transit systems, and a new car. We also want to explore space and bring safe water to the world's poor. But even a country as rich as the United States can't produce everything people want. So, like every other nation, we have to grapple with the core problem of **scarcity**—the fact that **there aren't enough resources available to satisfy all our desires.**

scarcity: Lack of enough resources to satisfy all desired uses of those resources.

Factors of Production

factors of production: Resource inputs used to produce goods and services, e.g., land, labor, capital, entrepreneurship.

The resources used to produce goods and services are called **factors of production.** ***The four basic factors of production are***

- ***Land.***
- ***Labor.***
- ***Capital.***
- ***Entrepreneurship.***

These are the *inputs* needed to produce desired *outputs.* To produce this text, for example, we needed paper, printing presses, a building, and lots of labor. We also needed people with good ideas who could put it together. To produce the education you're getting in this class, we need not only a text but a classroom, a teacher, a blackboard, and maybe a computer as well. **Without factors of production, we simply can't produce anything.**

Land. The first factor of production, land, refers not just to the ground but to all natural resources. Crude oil, water, air, and minerals are all included in our concept of "land."

Labor. Labor too has several dimensions. It's not simply a question of how many bodies there are. When we speak of labor as a factor of production, we refer to the skills and abilities to produce goods and services. Hence, both the quantity and the quality of human resources are included in the "labor" factor.

Capital. The third factor of production is capital. In economics the term **capital** refers to final goods produced for use in further production. The residents of fishing villages in southern Thailand, for example, braid huge fishing nets. The sole purpose of these nets is to catch more fish. The nets themselves become a factor of production in obtaining the final goods (fish) that people desire. Thus, they're regarded as *capital.* Blast furnaces used to make steel and desks used to equip offices are also capital inputs.

capital: Final goods produced for use in the production of other goods, such as equipment and structures.

Entrepreneurship. The more land, labor, and capital we have, the more we can produce potential output. A farmer with 10,000 acres, 12 employees, and six tractors can grow more crops than a farmer with half those resources. But there's no guarantee that he will. The farmer with fewer resources may have better ideas about what to plant, when to irrigate, or how to harvest the crops. ***It's not just a matter of what resources you have but also of how well you use them.*** This is where the fourth factor of production—**entrepreneurship**—comes in. The entrepreneur is the person who sees the opportunity for new or better products and brings together the resources needed for producing them. If it weren't for entrepreneurs, Thai fishers would still be using sticks to catch fish. Without entrepreneurship, farmers would still be milking their cows by hand. If someone hadn't thought of a way to miniaturize electronic circuits, you wouldn't be able to text your friends.

entrepreneurship: The assembling of resources to produce new or improved products and technologies.

The role of entrepreneurs in economic progress is a key issue in the market versus government debate. The British economist John Maynard Keynes argued that free markets unleash the "animal spirits" of entrepreneurs, propelling innovation, technology, and growth. Critics of government regulation argue that government interference in the marketplace, however well intentioned, tends to stifle those very same animal spirits.

Limits to Output

No matter how an economy is organized, there's a limit to how much it can produce. The most evident limit is the amount of resources available for producing goods and services. One reason the United States can produce so much is that it has nearly 4 million square miles of land. Tonga, with less than 300 square miles of land, will never produce as much. The United States also has a population of more than 340 million people. That's a lot less than China (1.4 billion) but far larger than 200 other nations (Tonga has a population of less than 110,000). So an abundance of raw resources gives us the potential to produce a lot of output. But that greater production capacity isn't enough to satisfy all our desires. We're constantly scrambling for additional resources to build more houses, make better movies, and provide more health care. That imbalance between available resources and our wish list is one of the things that make the job of Economist in Chief so difficult: He can't deliver everything people want.

The science of **economics** helps us frame these choices. In a nutshell, economics is the study of how people use scarce resources. How do you decide how much time to spend studying? How does Google decide how many workers to hire? How does Tesla decide whether to use its factories to produce sport utility vehicles or sedans? What share of a nation's resources should be devoted to space exploration, the delivery of health care services, or pollution control? In every instance, **alternative ways of using scarce labor, land, and capital resources are always available, and we have to choose one use over another.**

economics: The study of how best to allocate scarce resources among competing uses.

OPPORTUNITY COSTS

Scientists have long sought to explore every dimension of space. President Kennedy initiated a lunar exploration program that successfully landed men on the moon on July 20, 1969. That only whetted the appetite for further space exploration. President George W. Bush initiated a program to land people on Mars, using the moon as a way station. Scientists believe that the biological, geophysical, and technical knowledge gained from the exploration of Mars will improve life here on Earth. But should we do it? In a world of unlimited resources, the answer would be an easy "yes." But we don't live in that world.

Every time we use scarce resources in one way, we give up the opportunity to use them in other ways. If we use more resources to explore space, we have fewer resources available for producing earthly goods. The forgone earthly goods represent the **opportunity costs** of a Mars expedition. ***Opportunity cost is what is given up to get something else.*** Even a so-called free lunch has an opportunity cost. The resources used to produce the lunch could have been used to produce something else. A trip to Mars has a much higher opportunity cost. President Obama decided those opportunity costs were too high: He scaled back the Mars programs to make more resources available for Earthly uses (like education, highway construction, and energy development). President Trump agreed. While calling space exploration "wonderful," he observed, "Right now, we have bigger problems—we've got to fix our potholes." He reallocated scarce resources from space exploration to domestic infrastructure (roads, bridges, airports).

opportunity cost: The most desired goods or services that are forgone in order to obtain something else.

Your economics class also has an opportunity cost. The building space used for your economics class can't be used to show movies at the same time. Your professor can't lecture (produce education) and repair motorcycles simultaneously. The decision to use these scarce resources (capital, labor) for an economics class implies producing less of other goods.

Even reading this text is costly. That cost is not measured in dollars and cents. The true (economic) cost is, instead, measured in terms of some alternative activity. What would you like to be doing right now? The more time you spend reading this text, the less time you have available for other uses of your time. The opportunity cost of reading this text is the best alternative use of your scarce time. If you are missing your favorite TV show, we'd say that show is the opportunity cost of reading this text. It is what you gave up to do this assignment. Hopefully, the benefits you get from studying will outweigh that cost. Otherwise, this wouldn't be the best way to use your scarce time.

Guns vs. Butter

One of the most difficult choices nations must make about resource use entails defense spending. After the September 11, 2001, terrorist attacks on the World Trade Center and Pentagon, American citizens overwhelmingly favored an increase in military spending. Even the unpopularity of the wars in Iraq and Afghanistan didn't quell the desire for more national defense. But national defense, like Mars exploration, requires the use of scarce resources; Americans wanted to feel *safe*. But there is a *cost* to assuring safety: The 1.4 million men and women who serve in the armed forces aren't available to build schools, program computers, or teach economics. Similarly, the land, labor, capital, and entrepreneurship devoted to producing military hardware aren't available for producing civilian goods. An *increase* in national defense implies more sacrifices of civilian goods and services. How many schools, hospitals, or cars are we willing to sacrifice in order to "produce" more national security? This is the "guns versus butter" dilemma that all nations confront.

PRODUCTION POSSIBILITIES

The opportunity costs implied by our every choice are easy to visualize. Suppose a nation can produce only two goods, trucks and tanks. To keep things simple, assume that labor (workers) is the only factor of production needed to produce either good. Although other

	Production Options	
	Output of Trucks per Day	Output of Tanks per Day
Option *A*	5	0
Option *B*	4	2.0
Option *C*	3	3.0
Option *D*	2	3.8
Option *E*	1	4.5
Option *F*	0	5.0

TABLE 1.1

A Production Possibilities Schedule

As long as resources are limited, their use entails an opportunity cost. In this case, resources (labor) used to produce trucks can't be used for tank assembly at the same time. Hence, the forgone tanks are the opportunity cost of additional trucks. If all our resources were used to produce trucks (*Option A*), no tanks could be assembled. To produce tanks, we have to reduce truck production.

factors of production (land, machinery) are also needed in actual production, ignoring them for the moment does no harm. Assume further that we have a total of only 10 workers available per day to produce either trucks or tanks. That's a tiny workforce, but it makes the math a lot easier.

Our initial problem is to determine the *limits* of output. How many trucks or tanks *can* be produced in a day with available resources (our 10 workers)?

Before going any further, notice how opportunity costs emerge. If we use all 10 workers to manufacture trucks, how can we produce any tanks? All our workers will be busy building trucks; no one will be available to assemble tanks. In this case, forgone tanks would be the *opportunity cost* of a decision to employ all our resources in truck production.

We still don't know how many trucks could be produced with 10 workers or exactly how many tanks would be forgone by such a decision. To get these answers, we need more details about the production processes involved—specifically, how many workers are required to manufacture either good.

The Production Possibilities Curve

Table 1.1 summarizes the hypothetical choices, or **production possibilities,** that we confront in this case. Suppose we wanted to produce only trucks (i.e., no tanks). Row *A* of the table shows the *maximum* number of trucks we could produce. We have 10 workers available. Suppose it takes 2 workers to manufacture a truck in a day. Then, the *maximum* number of trucks we can produce is 5 per day.

production possibilities: The alternative combinations of final goods and services that could be produced in a given period with all available resources and technology.

Producing five trucks per day leaves no workers available to produce tanks. Our 10 available workers are all being used to produce trucks. Look at option *A* of Table 1.1; we've got "butter" (trucks) but no "guns" (tanks). If we want tanks, we roll back truck production. The remainder of Table 1.1 illustrates the trade-offs we confront in this simple case. By cutting truck production from five to four trucks per day (Option *B*), we reduce labor use in truck production from 10 workers to 8. That leaves 2 workers available for other uses, including the production of tanks.

If we employ these 2 workers to assemble tanks, we can build two tanks a day. We would then end up on row *B* of the table with four trucks and two tanks per day. What's the opportunity cost of these two tanks? It's the one additional truck (the fifth truck) that we could have produced but didn't.

As we proceed down the rows of Table 1.1, the nature of opportunity costs becomes apparent. Each additional tank built implies the loss (opportunity cost) of truck output. Likewise, every truck produced implies the loss of some tank output.

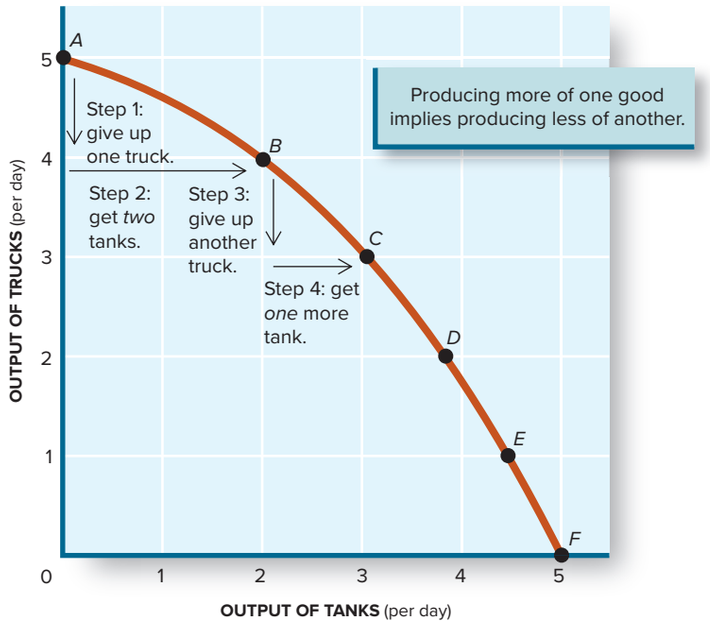
Choices, Choices These trade-offs between truck and tank production are illustrated in the production possibilities curve of Figure 1.1. ***Each point on the production possibilities curve depicts an alternative mix of output*** **that could be produced.** In this case, each point represents

FIGURE 1.1
A Production Possibilities Curve

A production possibilities curve (PPC) describes the various output combinations that could be produced in a given time period with available resources and technology. It represents a menu of output choices an economy confronts.

Point *B* indicates that we could produce a *combination* of four trucks and two tanks per day. Alternatively, we could produce one less truck and a third tank by moving to point *C*.

Points *A*, *D*, *E*, and *F* illustrate still other output combinations that *could* be produced. This curve is a graphic illustration of the production possibilities schedule in Table 1.1.



a different combination of trucks and tanks that we could produce in a single day using all available resources (10 workers in this case).

Notice in particular how points *A* through *F* in Figure 1.1 represent the choices described in each row of Table 1.1. At point *A*, we're producing five trucks per day and no tanks. As we move down the curve from point *A*, we're producing fewer trucks and more tanks. At point *B*, truck production has dropped from five to four vehicles per day while tank assembly has increased from zero to two. In other words, we've given up one truck to get two tanks assembled. The opportunity cost of those tanks is the one truck that is given up. A production possibilities curve, then, is simply a graphic summary of production possibilities, as described in Table 1.1. As such, ***the production possibilities curve illustrates two essential principles:***

- ***Scarce resources.*** There's a limit to the amount of output we can produce in a given time period with available resources and technology. In this case, we can't produce more than 5 tanks or 5 trucks.
- ***Opportunity costs.*** We can obtain additional quantities of any particular good only by reducing the potential production of another good. To get more trucks, we have to produce fewer tanks, and vice versa.

In an economy as vast as the United States, we can, of course, produce millions of trucks and millions of tanks. But that doesn't change the basic principles. Every tank produced uses resources that could have been used to produce something else. This principle helps explain why both presidents Obama and Trump chose to devote fewer resources to space exploration. They felt the opportunity costs (such as reduced education or less infrastructure) were simply too high.

Opportunity costs made headlines again in 2020. When the potential severity of the COVID-19 pandemic became evident, there was a sense of desperation about the availability of ventilators, the breathing machines that severely ill patients needed. The availability of hand sanitizers was also an urgent concern. How could we get *more* of these essential medical supplies? The answer in part was to change the *mix* of output. Auto companies altered their production lines to produce ventilators. Distilleries altered their whiskey-making process in order to produce more high-proof ethanol, the key ingredient in hand sanitizers. By changing production in these ways, the nation moved to a more desirable mix of output (the WHAT outcome).

Increasing Opportunity Costs

The shape of the production possibilities curve reflects another limitation on our choices. Notice how opportunity costs increase as we move along the production possibilities curve. When we cut truck output from five to four (step 1, Figure 1.1), we get two tanks (step 2). When we cut truck production further, however (step 3), we get only one tank per truck given up (step 4). The opportunity cost of tank production is increasing. This process of increasing opportunity cost continues. By the time we give up the last truck (row *F*), tank output increases by only 0.5: We get only half a tank for the last truck given up. These increases in opportunity cost are reflected in the outward bend of the production possibilities curve.

Why do opportunity costs increase? Mostly because it's difficult to move resources from one industry to another. It's easy to transform trucks to tanks on a blackboard. In the real world, however, resources don't adapt so easily. Workers who assemble trucks may not have the right skills for tank assembly. As we continue to transfer labor from one industry to the other, we start getting fewer tanks for every truck we give up.

The difficulties entailed in transferring labor skills, capital, and entrepreneurship from one industry to another are so universal that we often speak of the *law* of *increasing opportunity cost.* This law says that we must give up ever-increasing quantities of other goods and services in order to get more of a particular good. The law isn't based solely on the limited versatility of individual workers. The *mix* of factor inputs makes a difference as well. Truck assembly requires less capital than tank assembly. In a pinch, wheels can be mounted on a truck almost completely by hand, whereas tank treads require more sophisticated machinery. As we move labor from truck assembly to tank assembly, available capital may restrict our output capabilities.

The Cost of North Korea's Military

The production possibilities curve illustrates why the core economic decision about WHAT to produce is so difficult: We can't have everything we want and, worse yet, getting more of one thing implies getting less of something else. We are forced to make difficult choices.

Consider, for example, North Korea's decision to maintain a large military. North Korea is a relatively small country: Its population of 26 million ranks 50th in the world. Yet North Korea maintains the fourth-largest army in the world and continues to develop a nuclear weapons capability. To do so, it allocates as much as 20 percent of all its resources to feeding, clothing, and equipping its military forces. As a consequence, there aren't enough resources available to produce food. Without adequate machinery, seeds, fertilizer, or irrigation, North Korea's farmers can't produce enough food to feed the population (see World View "North Korean Food Rations Cut"). As Figure 1.2 illustrates, the opportunity cost of "guns" in Korea is a lot of needed "butter."

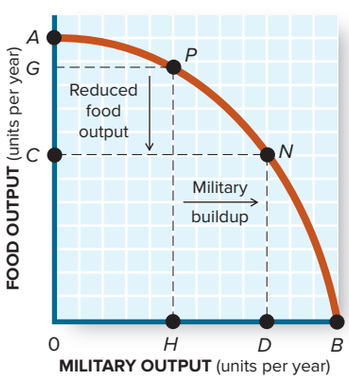


FIGURE 1.2
The Cost of War

North Korea devotes as much as 20 percent of its output to the military. The opportunity cost of this decision is reduced output of food. As the military expands from 0*H* to 0*D*, food output drops from 0*G* to 0*C*.

WORLD VIEW

WORLD'S LARGEST ARMIES

Rank	Country	Active Military
1	China	2,183,000
2	India	1,362,000
3	United States	1,282,000
4	North Korea	1,280,000
5	Russia	1,014,000
6	Pakistan	654,000
7	South Korea	525,000
8	Iran	523,000
9	Turkey	510,600
10	Vietnam	482,000

Source: U.S. Central Intelligence Agency 2019.

CRITICAL ANALYSIS: Nations "produce" national defense by employing land, labor, and capital in their armed forces. The **opportunity cost** of those "guns" is less "butter."

What is the opportunity cost of North Korea's army?

Ed Jones/AFP/Getty Images

During World War II, the United States confronted a similar trade-off. In 1944 nearly 40 percent of all U.S. output was devoted to the military. Civilian goods were so scarce that they had to be rationed. Staples like butter, sugar, and gasoline were doled out in small quantities. Even golf balls were rationed. In North Korea, golf balls would be a luxury even without a military buildup. As the share of North Korea's output devoted to the military increased, even basic food production became more difficult. (See World View "North Korean Food Rations Cut.")

WORLD VIEW

NORTH KOREAN FOOD RATIONS CUT

The United Nations estimates that 40 percent of North Korea's population—10.4 million people—experienced "food insecurity" in 2019. Most North Koreans depend on government-supplied food rations of rice, potatoes, and kimchi (fermented cabbage). Due to the worst harvests in a decade, however, the government slashed daily food rations from 380 grams (13.4 ounces) of food to only 300 grams (10.6 ounces). That is only half of the U.N. recommendation of at least 600 grams per day.

Source: United Nations Food and Agriculture Organization and news reports of May–November 2019.

NORTH KOREA RESUMES MISSILE LAUNCHES

After an 18-month hiatus, North Korea resumed ballistic missile launches in May. Since then, they have fired off seven more missiles, including one from a reputed submarine. Although keeping his promise not to test long-range missiles while continuing nuclear negotiations with President Trump, Kim Jong-un has vowed to strengthen North Korea's military capabilities. Analysts estimate that North Korea is now spending close to $2 billion a year on its nuclear and missile programs.

Source: Media reports, May–December 2019.

CRITICAL ANALYSIS: North Korea's inability to feed itself is partly due to maintaining its large army: Resources used for the military aren't available for producing food (**opportunity costs**).

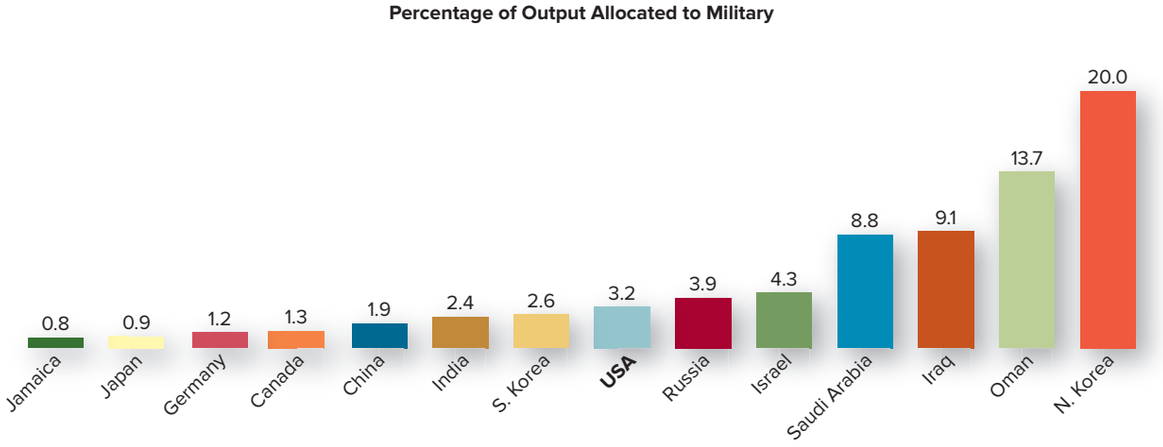


FIGURE 1.3

The Military Share of Output

The share of total output allocated to the military indicates the opportunity cost of maintaining an army. North Korea has the highest cost, using one-fifth of its resources for military purposes. Although China and the United States have much larger armies, their military share of output is much smaller.

Source: Stockholm International Peace Research Institute and U.S. Central Intelligence Agency (2018 data).

Figure 1.3 illustrates how other nations divide available resources between military and civilian production. The $650 billion the United States now spends on national defense absorbs only 3.2 percent of total output. This made the opportunity costs of the post-9/11 military buildup and the wars in Iraq and Afghanistan less painful. By contrast, North Korea's commitment to military spending (20 percent) implies a very high opportunity cost.

Efficiency

Not all of the choices on the production possibilities curve are equally desirable. They are, however, all *efficient*. **Efficiency** means squeezing *maximum* output out of available resources. Every point of the PPC satisfies this condition. Although the *mix* of output changes as we move around the production possibilities curve (Figures 1.1 and 1.2), at every point we are getting as much *total* output as physically possible. Because efficiency in production means simply getting the most from what you've got, **every point on the production possibilities curve is efficient.** At every point on the curve, we are using all available resources in the best way we know how.

efficiency: Maximum output of a good from the resources used in production.

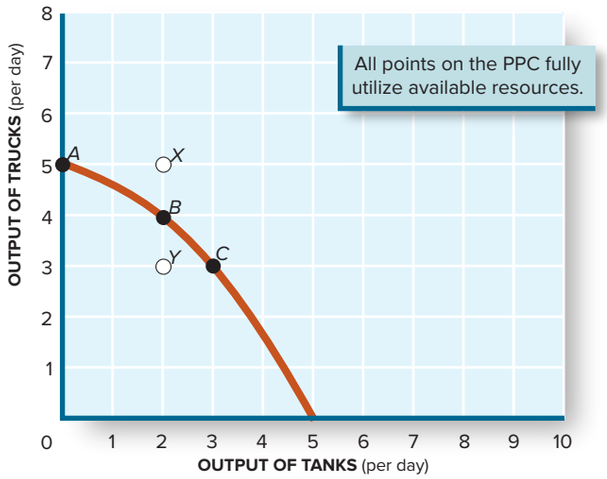
Inefficiency

There's no guarantee, of course, that we'll always use resources so efficiently. ***A production possibilities curve shows* potential *output, not* actual *output.*** If we're inefficient, actual output will be less than that potential. This happens. In the real world, workers sometimes loaf on the job. Or they call in sick and go to a baseball game instead of working. Managers don't always give the clearest directions or stay in touch with advancing technology. Even students sometimes fail to put forth their best effort on homework assignments. This kind of slippage can prevent us from achieving maximum production. When that happens, we end up *inside* the PPC rather than *on* it.

Point *Y* in Figure 1.4 illustrates the consequences of inefficient production. At point *Y*, we're producing only three trucks and two tanks. This is less than our potential. We could assemble a third tank without cutting back truck production (point *C*). Or we could get an extra truck without sacrificing any tank output (point *B*). Instead we're producing *inside* the production possibilities curve at point *Y*. **Whenever we're producing inside the production possibilities curve, we are forgoing the opportunity of producing (and consuming) additional output.**

FIGURE 1.4
Points Inside and Outside the PPC Curve

Points outside the production possibilities curve (point *X*) are unattainable with available resources and technology. Points inside the PPC (point *Y*) represent the incomplete use of available resources. Only points on the PPC (*A, B, C*) represent maximum use of our production capabilities.



Unemployment

We can end up inside the production possibilities curve by utilizing resources inefficiently or simply by not using all available resources. This happened repeatedly in the Great Recession of 2008–2009. In October 2009, more than 15 million Americans were unemployed (see Front Page Economics "Jobless Workers Outnumber Manufacturing Workers"). These men and women were ready, willing, and available to work, but no one hired them. As a result, we were stuck *inside* the PPC, producing less output than we could have (like point *Y* in Figure 1.4). The same problem surfaced in 2020 when the COVID-19 pandemic threw millions of Americans out of work and pushed the economy well below its production possibilities. The goal of U.S. economic policy is to create more jobs and keep the United States on its production possibilities curve.

Economic Growth

The challenge of getting to the production possibilities curve increases with each passing day. People are born every day. As they age, they enter the labor force as new workers. In the United States, over 1 million new workers enter the marketplace every year. They want jobs,

FRONT PAGE ECONOMICS

NEWS

JOBLESS WORKERS OUTNUMBER MANUFACTURING WORKERS

The number of jobless workers last month surpassed 15 million, according to the U.S. Bureau of Labor Statistics. The number of unemployed persons has risen every month since mid-2007 and is now double the level of unemployment that existed when the Great Recession started. Those 15 million *unemployed* workers now exceed the number of workers actually holding jobs in U.S. manufacturing.

Source: U.S. Bureau of Labor Statistics, October 2009.

CRITICAL ANALYSIS: In 2009 the U.S. economy was producing inside its production possibilities curve (like point *Y* in Figure 1.4), leaving millions of workers jobless and total output well below its potential. Our goal is to produce at a point on the PPC (**efficiency**).

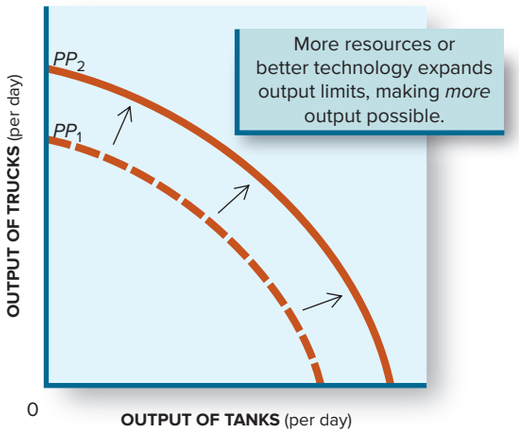


FIGURE 1.5
Growth: Increasing Production Possibilities
A production possibilities curve is based on *available* resources and technology. If more resources or better technology becomes available, production possibilities will increase. This economic growth is illustrated by the *shift* from PP_1 to PP_2.

and we want the output they can produce. Technology keeps advancing every year, too. That means every worker can produce *more* output. These increases in available labor and technology keep pushing the production possibilities curve outward. This **economic growth** is a good thing in the sense that it allows us to produce more goods and raise living standards. With economic growth, countries can have more guns *and* more butter (see Figure 1.5). But to get the benefits of that growth, we have to keep creating more and more jobs: We are always chasing a moving target. Nations that fail to achieve that growth risk declining living standards, as population growth exceeds output growth. That is a common problem in many of the world's poorest nations.

economic growth: An increase in output (real GDP); an expansion of production possibilities.

THREE BASIC DECISIONS

Production possibilities define the output choices that a nation confronts. From these choices, every nation must make some basic decisions. As we noted at the beginning of this chapter, the three core economic questions are

- ***WHAT to produce.***
- ***HOW to produce.***
- ***FOR WHOM to produce.***

What

There are millions of points along a production possibilities curve, and each one represents a different mix of output. Unfortunately, we can choose only *one* of these points at any time. The point we choose determines what mix of output actually gets produced. That choice determines how many guns are produced, and how much butter—or how many space expeditions are taken and how many sewage treatment facilities get built.

The production possibilities curve itself doesn't tell us which mix of output is best; it just lays out a menu of available choices. It's up to us to pick out the one and only mix of output that will be produced at a given time. This WHAT decision is a fundamental decision every nation must make.

How

Decisions must also be made about HOW to produce. Should we generate electricity by burning coal, smashing atoms, or harnessing solar power? Should we harvest ancient forests even if that destroys endangered owls or other animal species? Should we dump municipal and industrial waste into nearby rivers, or should we dispose of it in some other way? Should

we use children to harvest crops and stitch clothes, or should we use only adult labor? There are lots of different ways of producing goods and services, and someone has to make a decision about which production methods to use. The HOW decision is a question not just of efficiency but of social values as well.

For Whom

After we've decided what to produce and how, we must address a third basic question: FOR WHOM? Who is going to get the output produced? Should everyone get an equal share? Should everyone wear the same clothes and drive identical cars? Should some people get to enjoy seven-course banquets while others forage in garbage cans for food scraps? How should the goods and services an economy produces be distributed? Are we satisfied with the way output is now distributed?

THE MECHANISMS OF CHOICE

Answers to the questions of WHAT, HOW, and FOR WHOM largely define an economy. But who formulates the answers? Who actually decides which goods are produced, what technologies are used, or how incomes are distributed?

The Invisible Hand of a Market Economy

Adam Smith had an answer back in 1776. In his classic work *The Wealth of Nations,* the Scottish economist Smith said the "invisible hand" determines what gets produced, how, and for whom. The invisible hand he referred to wasn't a creature from a science fiction movie but, instead, a characterization of the way markets work.

Consider the decision about how many cars to produce in the United States. Who makes that decision? There's no "auto czar" who dictates how many vehicles will be produced this year. Not even General Motors can make such a decision. Instead, the *market* decides how many cars to produce. Millions of consumers signal their desire to have a car by browsing the Internet, visiting showrooms, and buying cars. Their purchases flash a green light to producers, who see the potential to earn more profits. To do so, they'll increase auto output. If consumers stop buying cars, profits will disappear. Producers will respond by reducing output, laying off workers, and even closing factories, as they did during the recession of 2008–2009 and again in 2020.

Notice how the invisible hand moves us along the production possibilities curve. If consumers demand more cars, the mix of output will include more cars and fewer of other goods. If auto production is scaled back, the displaced autoworkers will end up producing other goods and services, changing the mix of output in the opposite direction. In this scenario, consumers and producers are collectively deciding WHAT the economy will produce.

market mechanism: The use of market prices and sales to signal desired outputs (or resource allocations).

Adam Smith's invisible hand is now called the **market mechanism.** Notice that it doesn't require any direct contact between consumers and producers. Communication is indirect, transmitted by market prices and sales. Indeed, ***the essential feature of the market mechanism is the price signal.*** If you want something and have sufficient income, you can buy it. If enough people do the same thing, the total sales of that product will rise, and perhaps its price will as well. Producers, seeing sales and prices rise, will want to exploit this profit potential. To do so, they'll attempt to acquire a larger share of available resources and use it to produce the goods we desire. That's how the "invisible hand" works.

How does the market decide who gets this car?

somchai choochat/Shutterstock

The market mechanism can also answer the HOW question. To maximize their profits, producers seek the lowest-cost method of producing a good. By observing prices in the marketplace, they can identify the cheapest method and adopt it.

The market mechanism can also resolve the FOR WHOM question. A market distributes goods to the highest bidder. Individuals who are willing and able to pay the most for a product tend to get it in a pure market economy. That's why someone else—not you—is driving the newest McLaren 720S.

Adam Smith was so impressed with the ability of the market mechanism to answer the basic WHAT, HOW, and FOR WHOM questions that he urged government to "leave it alone" **(laissez faire). Adam Smith believed the price signals and responses of the marketplace were likely to do a better job of allocating resources than any government could.**

laissez faire: The doctrine of "leave it alone," of nonintervention by government in the market mechanism.

Government Intervention

The laissez-faire policy Adam Smith favored has always had its share of critics. The German economist Karl Marx emphasized how free markets tend to concentrate wealth and power in the hands of the few at the expense of the many. As he saw it, unfettered markets permit the capitalists (those who own the machinery and factories) to enrich themselves while the proletariat (the workers) toil long hours for subsistence wages. **Marx argued that the government not only had to intervene but had to *own* all the means of production**—the factories, the machinery, the land—in order to avoid savage inequalities. In *Das Kapital* (1867) and the revolutionary *Communist Manifesto* (1848), he laid the foundation for a communist state in which the government would be the master of economic outcomes.

The British economist John Maynard Keynes offered a less drastic solution. The market, he conceded, was pretty efficient in organizing production and building better mousetraps. However, individual producers and workers had no control over the broader economy. The cumulative actions of so many economic agents could easily tip the economy in the wrong direction. A completely unregulated market might veer off in one direction and then another as producers all rushed to increase output at the same time or throttled back production in a herdlike manner. The government, Keynes reasoned, could act like a pressure gauge, letting off excess steam or building it up as the economy needed. With the government maintaining overall balance in the economy, the market could live up to its performance expectations. While assuring a stable, full-employment environment, the government might also be able to redress excessive inequalities. **In Keynes's view, government should play an active but not all-inclusive role in managing the economy.**

Conservatives vs. Liberals

These historical views shed perspective on today's political debates. The core of most debates is some variation of the WHAT, HOW, or FOR WHOM questions. Much of the debate is how these questions should be answered. Conservatives favor Adam Smith's laissez-faire approach, with minimal government interference in the markets. Liberals, by contrast, think government intervention is needed to improve market outcomes. Conservatives resist workplace regulation, price controls, and minimum wages because such interventions might impair market efficiency. Liberals argue that such interventions temper the excesses of the market and promote both equity and efficiency.

World Opinion. The debate over how best to manage the economy is not unique to the United States. **Countries around the world confront the same choice between reliance on the market and reliance on the government.** Public opinion clearly favors the market system, as World View "Market Reliance vs. Government Reliance?" documents. Yet few countries have ever relied exclusively on either the markets or the government to manage their economy.

Degrees of Market Reliance. The World View "Index of Economic Freedom" categorizes nations by the extent of their actual market reliance. Hong Kong scores high on this index because its tax rates are relatively low, the public sector is comparatively small, and there are few restrictions on private investment or trade. By contrast, North Korea scores extremely low because the government owns all property, directly allocates resources, sets wages, rations food, and limits trade. In other words, Hong Kong is the most market-reliant; North Korea is the most government-reliant.

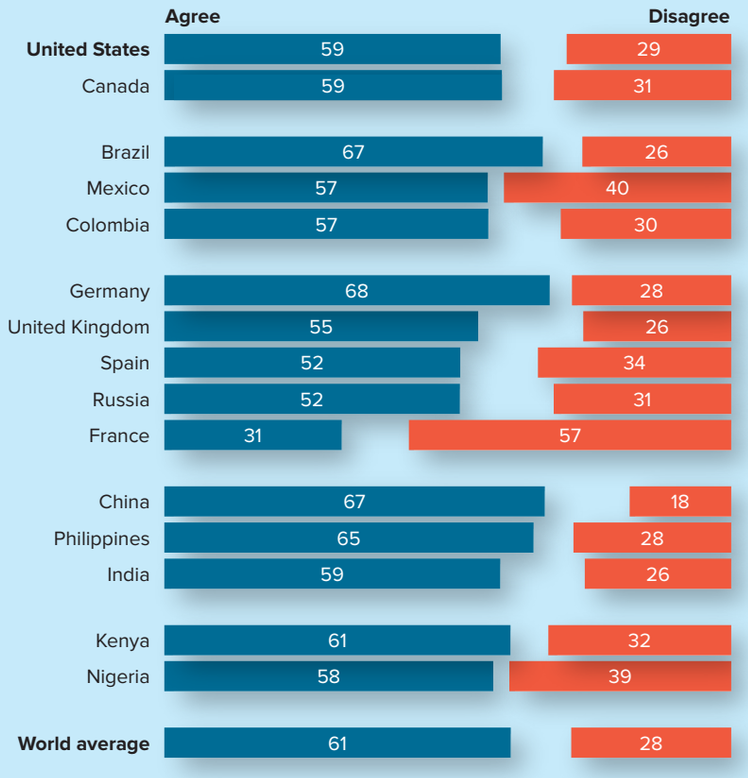
WORLD VIEW

MARKET RELIANCE VS. GOVERNMENT RELIANCE?

A public opinion poll conducted in countries from around the world found a striking global consensus that the free market economic system is best. In all but one country polled, a majority or plurality agreed with the statement that "the free enterprise system and free market economy is the best system on which to base the future of the world."

Source: GlobeScan Toronto–London–San Francisco 2010.

The free enterprise system and free market economy is the best system on which to base the future of the world.



CRITICAL ANALYSIS: Most people around the world believe that markets do a good job of answering the core questions of WHAT, HOW, and FOR WHOM. They favor a **laissez-faire** approach, albeit with government safeguards.

The Heritage rankings simply *describe* differences in the extent of market/government reliance across different nations. By themselves, they don't tell us which mix of market and government reliance is best. Moreover, the individual rankings change over time. In 1989 Russia began a massive transformation from a state-controlled economy to a more market-oriented economy. Some of the former Soviet republics (e.g., Estonia) became relatively free, while others (e.g., Turkmenistan) still rely on extensive government control of the economy. China has greatly expanded the role of private markets in the last 20 years, and Cuba is grudgingly moving in the same direction in fits and starts. Venezuela has moved in the opposite direction, with sharply increased government control of production and prices.

WORLD VIEW

INDEX OF ECONOMIC FREEDOM

Singapore ranks number one among the world's nations in economic freedom. It achieves that status with low tax rates, free-trade policies, minimal government regulation, and secure property rights. These and other economic indicators place Singapore at the top of the Heritage Foundation's 2020 country rankings by the degree of "economic freedom." The "most free" and the "least free" (repressed) economies on the list of 186 countries are listed here:

Greatest Economic Freedom	Least Economic Freedom
Singapore	North Korea
Hong Kong	Venezuela
New Zealand	Cuba
Australia	Eritrea
Switzerland	Republic of Congo
Ireland	Bolivia
United Kingdom	Zimbabwe
Denmark	Sudan

Source: *2020 Index of Economic Freedom*, Washington, DC: Heritage Foundation, 2020.

CRITICAL ANALYSIS: Nations differ in how much they rely on the **market mechanism** or government intervention to shape economic outcomes. Nations that rely the least on government intervention score highest ("most free") on this Index of Economic Freedom.

Notice that the United States is not on the World View list. Although the United States relies heavily on private markets to make WHAT, HOW, and FOR WHOM decisions, it lags behind Hong Kong, Canada, and other nations on the Heritage Index. In 2020 the United States came in 17th, down a notch from earlier years. That modest decline was largely due to the increased international trade barriers erected by President Trump. This tug-of-war between more government regulation and more market reliance continues—in both public opinion and the U.S. Congress.

A Mixed Economy

No one advocates *complete* dependence on markets, nor *total* government control of economic resources. Neither Adam Smith's invisible hand nor the governments' very visible hand always works perfectly. As a result, ***the United States, like most nations, uses a combination of market signals and government directives to direct economic outcomes.*** The resulting compromises are called **mixed economies.**

mixed economy: An economy that uses both market signals and government directives to allocate goods and resources.

The reluctance of countries around the world to rely exclusively on either market signals or government directives is due to the recognition that both mechanisms can and do fail on occasion. As we've seen, market signals are capable of answering the three core questions of WHAT, HOW, and FOR WHOM. But the answers may not be the best possible ones.

Market Failure

When market signals don't give the best possible answers to the WHAT, HOW, and FOR WHOM questions, we say that the market mechanism has *failed.* Specifically, **market failure** means that the invisible hand has failed to achieve the best possible outcomes. If the market fails, we end up with the wrong (*sub*optimal) mix of output, too much unemployment, polluted air, or an inequitable distribution of income.

market failure: An imperfection in the market mechanism that prevents optimal outcomes.

In a market-driven economy, for example, producers will select production methods based on cost. Cost-driven production decisions, however, may encourage a factory to spew pollution into the environment rather than to use cleaner but more expensive methods of production. The resulting pollution may be so bad that society ends up worse off as a result of the extra production. In such a case we may need government intervention to force better answers to the WHAT and HOW questions.

We could also let the market decide who gets to consume cigarettes. In that laissez-faire situation, anyone with enough money to buy a pack of cigarettes would then be entitled to smoke. What if, however, children aren't experienced enough to balance the risks of smoking against the pleasures? What if nonsmokers are harmed by secondhand smoke? In this case as well, the market's answer to the FOR WHOM question might not be optimal.

After the experience with the coronavirus in 2020, nearly everyone recognized that markets alone cannot assure optimal outcomes. While secondhand smoke is a significant problem for unregulated markets, COVID-19 contagion is far more deadly. If we had relied on free choice to determine how much social distancing or treatment was undertaken, many more people would have died from COVID-19. There was near universal consensus that government intervention (regulation, subsidized care, etc.) was needed to get better results.

Then there is the question of fairness. What if the market mechanism distributed incomes so unequally that some people couldn't afford basic necessities while others engaged in conspicuous consumption? Would that be *fair?* The market itself doesn't worry about fairness, but society might. In that event, we might want the government to intervene to change the answer to the FOR WHOM question.

Government Failure

Clearly, government intervention might be needed to correct market failures. If successful, the resulting mix of market signals and government directives would be an improvement over a purely market-driven economy. But government intervention may fail as well. **Government failure** occurs when government intervention fails to improve market outcomes or actually makes them worse.

government failure: Government intervention that fails to improve economic outcomes.

Government failure often occurs in unintended ways. For example, the government may intervene to force an industry to clean up its pollution. The government's directives may impose such high costs that the industry closes factories and lays off workers. Some cutbacks in output might be appropriate, but they could also prove excessive. The government might also mandate pollution control technologies that are too expensive or even obsolete. None of this has to happen, but it might. If it does, government failure will have worsened economic outcomes.

The government might also fail if it interferes with the market's answer to the FOR WHOM question. For 50 years, communist China distributed goods by government directive, not market performance. Incomes were more equal, but uniformly low. To increase output and living standards, China turned to market incentives. As entrepreneurs responded to these incentives, living standards rose dramatically—even while inequality increased. That surge in living standards made the vast majority of Chinese believers in the power of free markets (see the World View appearing earlier in this chapter).

Excessive taxes and transfer payments can also worsen economic outcomes. If the government raises taxes on the rich to pay welfare benefits for the poor, neither the rich nor the poor may see much purpose in working. In that case, the attempt to give everybody a "fair" share of the pie might end up shrinking the size of the pie. If that happened, society could end up worse off.

Seeking Balance

None of these failures has to occur. But they might. ***The challenge for any society is to minimize economic failures by selecting the appropriate balance of market signals and government directives.*** This isn't an easy task. To begin with, it requires that we share some common perspectives about what mix of output is best, what the balance between production and environmental

protection should be, and how much inequality is fair. On a more mundane level, it also requires that we know how markets work and why they sometimes fail. We also need to know what policy options the government has and how and when they might work. That's a lot to ask for.

WHAT ECONOMICS IS ALL ABOUT

Understanding how economies function is the basic purpose of studying economics. We seek to know how an economy is organized, how it behaves, and how successfully it achieves its basic objectives. Then, if we're lucky, we can discover better ways of attaining those same objectives.

Ends vs. Means

Economists don't formulate an economy's objectives. Instead they focus on the *means* available for achieving given *goals.* In 1978, for example, the U.S. Congress identified "full employment" as a major economic goal. Congress then directed future presidents (and their economic advisers) to formulate policies that would enable us to achieve full employment. The economist's job is to help design policies that will best achieve this and other economic goals.

The same distinction between ends and means is integral to your own life. Your *goal* (the ends) may be to achieve a specific career. The immediate question is how best to achieve that goal (the means). Should you major in economics? Take computer science? Study art history? Surely, you hope that the course choices you make will best help you attain your career goals. Economists can help select those courses based on studies of other students, their majors, and their career outcomes.

Normative vs. Positive Analysis

The distinction between ends and means is mirrored in the difference between *normative* analysis and *positive* analysis. Normative analysis incorporates subjective judgments about what *ought* to be done. Positive analysis focuses on how things might be done without subjective judgments of what is "best." The Heritage Index of Economic Freedom (World View), for example, constitutes a *positive* analysis to the extent that it objectively describes global differences in the extent of market reliance. That effort entails collecting, sorting, and ranking mountains of data. Heritage slides into *normative* analysis when it suggests that market reliance is tantamount to "economic freedom" and inherently superior to more government intervention—that markets are good and governments are bad.

Debates over the core FOR WHOM question likewise reflect both positive and normative analysis. A positive analysis would observe that the U.S. incomes are very "unequal," with the richest 20 percent of the population getting half of all income (see table in Figure 2.3). That's an observable fact—that is, positive analysis. To characterize that same distribution as "inequitable" or "unfair" is to transform (positive) fact into (normative) judgment. Economists are free, of course, to offer their judgments but must be careful to distinguish positive and normative perspectives.

Macro vs. Micro

The study of economics is typically divided into two parts: macroeconomics and microeconomics. **Macroeconomics** focuses on the behavior of an entire economy—the "big picture." In macroeconomics we worry about such national goals as full employment, control of inflation, and economic growth, without worrying about the well-being or behavior of specific individuals or firms. The essential concern of macroeconomics is to understand and improve the performance of the economy as a whole.

Microeconomics is concerned with the details of this big picture. In microeconomics we focus on the individuals, firms, and government agencies that actually compose the larger economy. Our interest here is in the behavior of individual economic actors. What are their goals? How can they best achieve these goals with their limited resources? How will they respond to various incentives and opportunities?

macroeconomics: The study of aggregate economic behavior, of the economy as a whole.

microeconomics: The study of individual behavior in the economy, of the components of the larger economy.

A primary concern of *macro*economics, for example, is to determine how much money, *in total,* consumers will spend on goods and services. In *micro*economics, the focus is much narrower. In micro, attention is paid to purchases of *specific* goods and services rather than just aggregated totals. Macro likewise concerns itself with the level of *total* business investment, while micro examines how *individual* businesses make their investment decisions.

Although they operate at different levels of abstraction, macro and micro are intrinsically related. Macro (aggregate) outcomes depend on micro behavior, and micro (individual) behavior is affected by macro outcomes. One can't fully understand how an economy works until one understands how all the individual participants behave. But just as you can drive a car without knowing how its engine is constructed, you can observe how an economy runs without completely disassembling it. In macroeconomics we observe that the car goes faster when the accelerator is depressed and that it slows when the brake is applied. That's all we need to know in most situations. At times, however, the car breaks down. When it does, we have to know something more about how the pedals work. This leads us into micro studies. How does each part work? Which ones can or should be fixed?

Our interest in microeconomics is motivated by more than our need to understand how the larger economy works. The "parts" of the economic engine are people. To the extent that we care about the well-being of individuals, we have a fundamental interest in microeconomic behavior and outcomes. In this regard, we examine how individual consumers and business firms seek to achieve specific goals in the marketplace. The goals aren't always related to output. Gary Becker won the 1992 Nobel Prize in Economics for demonstrating how economic principles also affect decisions to marry, to have children, to engage in criminal activities—or even to complete homework assignments in an economics class.

Theory vs. Reality

The economy is much too vast and complex to describe and explain in one course (or one lifetime). We need to simplify it. To do so, we focus on basic relationships, ignoring annoying details. We develop basic principles of economic behavior and then use those principles to predict and explain economic events. This means that we formulate theories, or *models,* of economic behavior and then use those theories to evaluate and design economic policy.

Our model of consumer behavior assumes, for example, that people buy less of a good when its price rises. In reality, however, people *may* buy *more* of a good at increased prices, especially if those high prices create a certain snob appeal or if prices are expected to increase still further. In predicting consumer responses to price increases, we typically ignore such possibilities by *assuming* that the price of the good in question is the *only* thing that changes. This assumption of "other things remaining equal" (unchanged) (in Latin, ***ceteris paribus***) allows us to make straightforward predictions. If instead we described consumer responses to increased prices in any and all circumstances (allowing everything to change at once), every prediction would be accompanied by a book full of exceptions and qualifications. We'd look more like lawyers than economists.

ceteris paribus: The assumption of nothing else changing.

Although the assumption of *ceteris paribus* makes it easier to formulate economic theory and policy, it also increases the risk of error. If other things do change in significant ways, our predictions (and policies) may fail. But like weather forecasters, we continue to make predictions, knowing that occasional failure is inevitable. In so doing, we're motivated by the conviction that it's better to be approximately right than to be dead wrong.

Imperfect Knowledge. One last word of warning before you read further. Economics claims to be a science in pursuit of basic truths. We want to understand and explain how the economy works without getting tangled up in subjective value judgments. This may be an impossible task. First, it's not clear where the truth lies. For more than 200 years economists have been arguing about what makes the economy tick. None of the competing theories has performed spectacularly well. Indeed, few economists have successfully predicted major economic events with any consistency. Even annual forecasts of inflation, unemployment,

and output are regularly in error. Worse still, never-ending arguments about what caused a major economic event continue long after it occurs. In fact, economists are still arguing over the primary causes of the Great Depression of the 1930s!

In view of all these debates and uncertainties, don't expect to learn everything there is to know about the economy today in this text or course. Our goals are more modest. We want to develop a reasonable perspective on economic behavior, an understanding of basic principles. With this foundation, you should acquire a better view of how the economy works. Daily news reports on economic events should make more sense. Congressional debates on tax and budget policies should take on more meaning. You may even develop some insights that you can apply toward running a business, planning a career, or simply managing your scarce time and money more efficiently.

DECISIONS FOR TOMORROW

What Is the Cost of Going Green?

People are worried about the future of the planet. Continued population and production growth have raised concerns about global warming. The earth's temperature has risen over time, and scientists are worried that the warming trend is accelerating. In 2018, the United Nations warned that weather patterns will become more extreme, droughts will spread, and the solar ice field will melt if we don't curb the greenhouse gas emissions that are a root cause of global warming. Those warnings have spawned calls for "going green," that is, replacing carbon-based energy sources with clean, renewable, and zero-emissions energy sources like wind and solar. A proposed Green New Deal calls for the complete elimination of carbon-based energy by 2030.

That is a tall order. The United States now gets 80 percent of its energy from coal, petroleum, and natural gas—all carbon-based fuels. We get another 10 percent from nuclear power. Only 10 percent or so comes from renewable sources like wind and solar. So, while everyone might share the goal of an emissions-free future, we have to ask how we get from here to there.

Opportunity Costs. It's easy to get excited about a solar-powered future. But before we jump on the solar bandwagon, we have to at least consider the costs involved. Sure, the sun's rays are free. But you need a lot of capital investment to harness that solar power. Solar panels on the roof don't come free. Nor do solar-powered electrical charging stations, solar power plants, or the electrical grids that distribute electricity to users. To develop a nationwide, complete solar power infrastructure would cost *trillions* of dollars. That's only the beginning. We'd also have to change the technology embedded in our transportation systems, office buildings, homes, and even farms. Retrofitting existing infrastructure would cost billions of dollars. Building new transportation systems would cost even more. The dollar cost of "going green" would be tens of trillions.

In economics we don't think in terms of papers dollars, but instead in terms of opportunity costs. Paper money doesn't build solar panels; it takes real factors of production—land, labor, capital, and entrepreneurship. Those resources—worth trillions of dollars—could be used to produce something else. If we invested that many resources in medical technology, we might cure cancer, find an antidote for the COVID-19 virus, and maybe even eradicate the flu. Investing that many resources in education might make college not only more enjoyable but a lot more productive as well. To invest all those resources in renewable energy implies that "going green" trumps all other social goals. That's a *normative* judgment that not everyone embraces. Many people worry more about their education, their homes, national defense, and the nation's infrastructure than the harm that conventional energy sources inflict on the environment. In deciding whether and how intensively to develop clean energy, we have to assess opportunity costs—what goods and services we implicitly forsake in order to "go green."

Are wind farms a free good?

xxlphoto/123RF

SUMMARY

- Scarcity is a basic fact of economic life. Factors of production (land, labor, capital, entrepreneurship) are scarce in relation to our desires for goods and services. LO1-1
- All economic activity entails opportunity costs. Factors of production (resources) used to produce one output cannot simultaneously be used to produce something else. When we choose to produce one thing, we forsake the opportunity to produce some other good or service. LO1-2
- A production possibilities curve (PPC) illustrates the limits to production—the various combinations of goods and services that could be produced in a given period if all available resources and technology are used efficiently. The PPC also illustrates opportunity costs—what is given up to get more of something else. LO1-3
- The bent shape of the PPC reflects the law of increasing opportunity costs: Increasing quantities of any good can be obtained only by sacrificing ever-increasing quantities of other goods. LO1-3
- Inefficient or incomplete use of resources will fail to attain production possibilities. Additional resources or better technologies will expand them. This is the essence of economic growth. LO1-3
- Every country must decide WHAT to produce, HOW to produce, and FOR WHOM to produce with its limited resources. LO1-4
- The study of economics focuses on the broad question of resource allocation. Macroeconomics is concerned with allocating the resources of an entire economy to achieve aggregate economic goals (e.g., full employment). Microeconomics focuses on the behavior and goals of individual market participants. LO1-4
- The WHAT, HOW, and FOR WHOM choices can be made by the market mechanism or by government directives. Most nations are mixed economies, using a combination of these two choice mechanisms. LO1-5
- Market failure exists when market signals generate suboptimal outcomes. Government failure occurs when government intervention worsens economic outcomes. The challenge for economic theory and policy is to find the mix of market signals and government directives that best fulfills our social and economic goals. LO1-5

Key Terms

scarcity
factors of production
capital
entrepreneurship
economics
opportunity cost
production possibilities
efficiency
economic growth
market mechanism
laissez faire
mixed economy
market failure
government failure
macroeconomics
microeconomics
ceteris paribus

Questions for Discussion

1. What opportunity costs did you incur in reading this chapter? If you read another chapter today, would your opportunity cost (per chapter) increase? Explain. LO1-2
2. How much time *could* you spend on homework in a day? How much do you spend? How do you decide? LO1-2
3. What's the real cost of a "free lunch," as mentioned in the discussion of "Opportunity Costs?" LO1-2
4. How might a nation's production possibilities be affected by the following? LO1-3
   (*a*) Discovery of a new oil field.
   (*b*) A decrease in immigration.
   (*c*) An increase in military spending.
   (*d*) More job training.
5. What was the opportunity cost of more hand sanitizers during the COVID-19 crisis? LO1-2
6. Who would go to college in a completely private (market) college system? How does government intervention change this FOR WHOM outcome? LO1-4
7. Why do people around the world have so much faith in free markets (World View "Market Reliance vs. Government Reliance?")? LO1-5
8. What is the connection between North Korea's missile program and its hunger problem? (World View "North Korean Food Rations Cut") LO1-2
9. Explain why there are limits to output and how these limits force economies to make trade-offs. LO1-1
10. If climate change was in fact the greatest threat to society, should all our resources be used to combat it? What percentage of our output should be devoted to the pursuit of a carbon-neutral economy? LO1-2

PROBLEMS FOR CHAPTER 1

connect

LO1-2 1. According to Table 1.1 (or Figure 1.1), what is the opportunity cost of the second truck produced?

LO1-3 2. (*a*) Compute the opportunity cost in forgone consumer goods (millions of pounds of butter) for each additional unit of military output produced (number of planes):

Military output	0	1	2	3	4	5
Consumer goods output	100	95	80	60	35	0
Opportunity cost		___	___	___	___	___

(*b*) As military output increases, are opportunity costs increasing, decreasing, or remaining constant?

LO1-3 3. According to Figure 1.2, how much food production is sacrificed when North Korea moves from point *P* to point *N*?

LO1-2 4. (*a*) If the average North Korean farmer produces 1,500 pounds of food per year, what is the opportunity cost, in pounds of food, of North Korea's army (World View "World's Largest Armies")?

(*b*) If a person needs at least 500 pounds of food per year to survive, how many people could have been fed with the forgone food output?

LO1-2 5. What is the opportunity cost (in civilian output) of a defense buildup that raises military spending from 3.2 to 3.4 percent of a $22 trillion economy?

LO1-5 6. According to Figure 1.3, what percent of output consists of nonmilitary goods in

(*a*) Jamaica?

(*b*) Russia?

LO1-3 7. According to the figure below (similar to Figure 1.4),

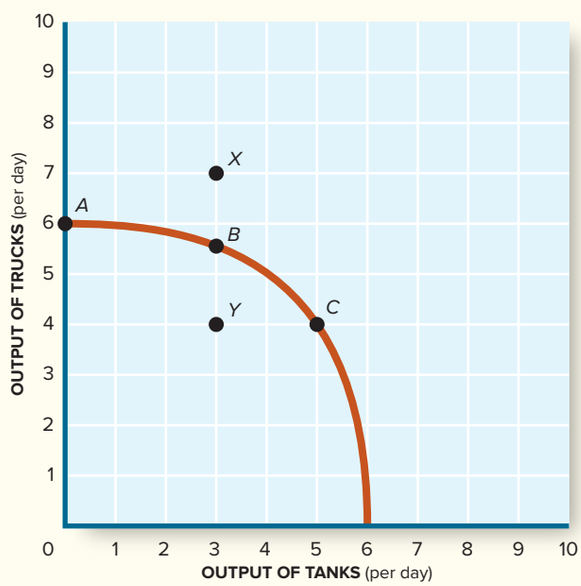
(*a*) At which point(s) is this society producing some of each type of output but producing inefficiently?

(*b*) At which point(s) is this society producing the most output possible with the available resources and technology?

(*c*) At which point(s) is the output combination unattainable with available resources and technology?

(*d*) Show the change that would occur if the resources of this society increased. Label this curve PPC_2.

(*e*) Show the change that would occur with a huge natural disaster that destroyed one-third of production capacity. Label this curve PPC_3.



PROBLEMS FOR CHAPTER 1 (cont'd)

LO1-3 8. You have only 20 hours per week to use for either study time or fun time. Suppose the relationship between study time, fun time, and grades is shown in this table:

Fun time (hours per week)	16	12	8	4	0
Study time (hours per week)	0	4	8	12	16
Grade point average	*0*	*1.0*	*2.0*	*3.0*	*4.0*

(*a*) Draw the (linear) production possibilities curve on a graph that represents the alternative uses of your time.
(*b*) On the same graph, show the combination of study time and fun time that would get you a 2.0 grade average.
(*c*) What is the cost, in lost fun time, of raising your grade point average from 2.0 to 3.0?

LO1-5 9. According to the World View "Market Reliance vs. Government Reliance?," which nation has
(*a*) The highest level of faith in the market system?
(*b*) The lowest level of faith in the market system?

LO1-2 10. If a student literally had "nothing else to do,"
(*a*) What would be the opportunity cost of doing this homework?
(*b*) What is the likelihood of that?

LO1-1 11. According to the World View "World's Largest Armies," what percent of the total population is serving in the military in
(*a*) The United States (population = 340 million)?
(*b*) North Korea (population = 25 million)?
(*c*) China (population = 1.4 billion)?

LO1-2 12. ***Decisions for Tomorrow:*** What is the opportunity cost of investing $1 trillion in clean energy technology?