THE ANNUAL REPORT
OF THE
COUNCIL OF ECONOMIC ADVISERS

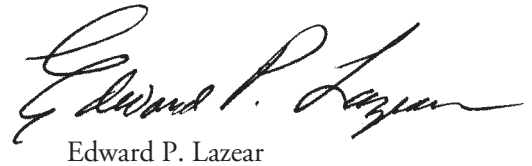
LETTER OF TRANSMITTAL

Council of Economic Advisers
Washington, D.C., January 16, 2009

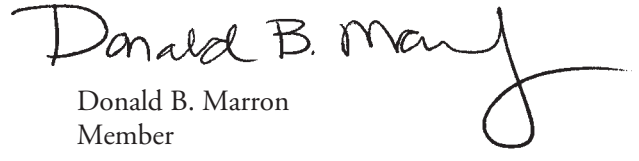
Mr. President:

The Council of Economic Advisers herewith submits its 2009 Annual Report in accordance with the provisions of the Employment Act of 1946 as amended by the Full Employment and Balanced Growth Act of 1978.

Sincerely,



Edward P. Lazear
Chairman



Donald B. Marron
Member

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Overview

The U.S. economy has proven itself remarkably resilient over the past 8 years, having withstood a number of major shocks throughout the period. During the last few months of 2008, however, the economy encountered major shocks in the financial sector that it could not shake off. Those financial shocks combined with other factors—record high commodity prices earlier in the year, natural disasters, and continued weakness in the housing market—to cause the economy to contract modestly in the third quarter and what appears to be a sharp decline in the fourth quarter (see Chapters 1 and 2). The contraction will likely last into early- or mid-2009. Despite rapid fiscal and monetary policy action in response to weakening economic conditions, the economy entered into recession at the end of 2007, ending 6 years of expansion and a record 52 months of uninterrupted job growth. Several factors contributed over many years to create the credit difficulties that reached crisis proportions late in the year. The magnitude of the crisis required unprecedented policy responses to reduce the extent of the damage to the economy. These policy actions have laid a foundation for a strong economic recovery early in the term of the next Administration. Most market forecasts suggest the weakness will continue in the first half of 2009, followed by a recovery beginning in the second half of 2009 that will gain momentum in 2010 and beyond.

Despite the risk that recent events may overshadow the many positive developments of the past 8 years, there have been major policy advances that have improved the long-term prospects of our economy and strengthened its foundation. Much of this *Report* examines the effects of pro-growth economic policies and market-based reforms adopted during the Administration, as well as policy considerations that will further improve the long-term position of our economy and allow more Americans to realize the benefits of economic expansion in the future.

Record-high energy prices in 2008 highlighted our economy's dependence on fossil fuels and underscored the need to diversify our national energy portfolio. Although it will take time and major technological breakthroughs to substantially reduce our dependence on fossil fuels, the Administration has invested unprecedented levels of Federal resources and adopted a number of policies that have helped advance the economy's transition to new sources of energy while reducing local and regional pollutants in responsible ways that do not threaten our economic well-being (see Chapter 3).

Export performance was one of the bright spots in the economy over the past several years, and played an important role in offsetting other areas of weakness in the economy. The United States's continued commitment to open trade and investment policies will be an important factor in maintaining the international competitiveness and the dynamic nature of our economy (see Chapter 4). Lower tax rates have also contributed to economic performance by easing the burden on labor and capital and enabling firms, investors, and consumers to allocate resources more efficiently (see Chapter 5). These policies, which contribute to the increased flexibility of the economy, will be important in facilitating the economic recovery going forward. There remains considerable opportunity to strengthen our economic position by eliminating the uncertainty surrounding tax relief that is scheduled to expire. In addition, rising health care costs and spending on entitlement programs are ongoing areas of concern, and the Administration has offered reforms that could substantially lower costs and improve our fiscal position (see Chapters 6 and 7). Education is essential to future prosperity, and the Administration has taken several steps to improve kindergarten through twelfth-grade education and to make college more affordable (see Chapter 8). Finally, as highlighted by the recent financial crisis, there are several areas in which regulatory reforms are necessary and appropriate to address market failures. The Administration has pursued market-oriented regulatory reforms that favor individual choice over Government decision making wherever appropriate, and this approach has proven effective in addressing market failures without imposing excessive costs on society or the economy (see Chapter 9).

Chapter 1: The Year in Review and the Years Ahead

Following 6 consecutive years of expansion of the U.S economy, the pace of real GDP expansion slowed in the first half of 2008 and turned negative in the second half. The Business Cycle Dating Committee of the National Bureau of Economic Research declared that the economy peaked in December of 2007, then began a recession that continued throughout 2008. Falling house prices initiated a cascade of problems that threatened the solvency of several major financial institutions and resulted in a major decline in the stock market. To respond to these problems, policymakers undertook a wide range of fiscal and monetary policy actions. Chapter 1 reviews the economic developments of 2008 and discusses the Administration's forecast for the years ahead. The key points of Chapter 1 are:

- Real GDP likely declined over the four quarters of 2008, ending a 6-year run of positive growth, as the slow growth in the first half of the year was eclipsed by what appears to be a sharp decline in the fourth quarter.
- Financial distress, which first became evident in mid-2007 in the market for mortgage-backed securities (MBS), continued through 2008 and affected a variety of markets. In the wake of the failure and near-failure of several major financial institutions in September 2008, financial stresses increased sharply to levels not seen during the post–World War II era.
- Payroll jobs declined during 2008, having peaked in December of 2007. Employment losses averaged 82,000-per-month during the first 8 months of 2008, before accelerating to a 420,000-per-month pace during the next 3 months. The unemployment rate was at 5 percent rate though April—a low rate by historical standards—but increased to 6.7 percent in November. Initial and continued claims for unemployment insurance moved up sharply over the course of the year.
- Energy prices dominated the movement of overall inflation in the consumer price index (CPI), with large increases through July, followed by a sharp decline during the latter part of the year. Core consumer inflation (which excludes food and energy inflation) edged down from 2.4 percent during the 12 months of 2007 to a 1.9 percent annual rate during the first 11 months of 2008. Food prices rose appreciably faster than core prices.
- Nominal hourly compensation increased 2.8 percent during the 12 months through September 2008 (according to the employment cost index), a gain that was undermined by the rise in food and energy prices, so that real hourly compensation fell 2 percent. In the long run, real hourly compensation tends to increase with labor productivity, although the correlation can be very loose over shorter intervals. Nonfarm business productivity has grown at an average annual rate of 2.6 percent since the business cycle peak in 2001.
- An economic stimulus was proposed by the President in January and passed by Congress in February, authorizing about $113 billion in tax rebate checks to low- and middle-income taxpayers and allowing 50 percent expensing for business equipment investment. The stimulus likely boosted GDP growth in the second and third quarters above what it might have been otherwise, but its influence faded by the end of the year.
- The Administration's forecast calls for real GDP to continue to fall in the first half of 2009, with the major declines projected to be concentrated in the fourth quarter of 2008 and the first quarter of 2009. An active monetary policy and the Treasury's injection of assets into financial institutions are expected to ease financial stress and to lead to a

rebound in the interest-sensitive sectors of the economy in the second half of 2009. Also supporting growth during 2009 is the substantial recent drop in petroleum prices, which offsets some of the effects of the recent decline in household wealth. The unemployment rate is expected to increase to an average of 7.7 percent for 2009. The expansion in 2010–11 is projected to be vigorous, bringing the unemployment rate down to 5 percent by 2012.

Chapter 2: Housing and Financial Markets

In the summer of 2008, the disruptions in credit markets that began in 2007 worsened to the point that the global financial system was in crisis. The magnitude of the crisis required an unprecedented response on the part of the Government to limit the extent of damage to the economy and restore stability to the financial system. Chapter 2 reviews the origins of the crisis, its consequences, the Government's response, and discusses several policy challenges going forward. The key points of Chapter 2 are:

- The roots of the current global financial crisis began in the late 1990s. A rapid increase in saving by developing countries (sometimes called the "global saving glut") resulted in a large influx of capital to the United States and other industrialized countries, driving down the return on safe assets. The relatively low yield on safe assets likely encouraged investors to look for higher yields from riskier assets, whose yields also went down. What turned out to be an underpricing of risk across a number of markets (housing, commercial real estate, and leveraged buyouts, among others) in the United States and abroad, and an uncertainty about how this risk was distributed throughout the global financial system, set the stage for subsequent financial distress.
- The influx of inexpensive capital helped finance a housing boom. House prices appreciated rapidly earlier in this decade, and building increased to well-above historic levels. Eventually, house prices began to decline with this glut in housing supply.
- Considerable innovations in housing finance—the growth of subprime mortgages and the expansion of the market for assets backed by mortgages—helped fuel the housing boom. Those innovations were often beneficial, helping to make home ownership more affordable and accessible, but excesses set the stage for later losses.
- The declining value of mortgage-related assets has had a disproportionate effect on the financial sector because a large fraction of mortgage-related assets are held by banks, investment banks, and other highly levered financial institutions. The combination of leverage (the use of borrowed

funds) and, in particular, a reliance on short-term funding made these institutions (both in the United States and abroad) vulnerable to large mortgage losses.

- Vulnerable institutions failed, and others nearly failed. The remaining institutions pulled back from extending credit to each other, and interbank lending rates increased to unprecedented levels. The effects of the crisis were most visible in the financial sector, but the impact and consequences of the crisis are being felt by households, businesses, and governments throughout the world.
- The U.S. Government has undertaken a historic effort to address the underlying problems behind the freeze in the credit markets. These problems, the subject of much of this chapter, are a sudden increase in the desire for liquidity, a massive reassessment of risk, and a solvency crisis for many systemically important institutions. The Government has worked to preserve the stability of the overall financial system by preventing the disorderly failures of important financial institutions; taken unprecedented action to boost liquidity in short-term funding markets; provided substantial new protections for consumers, businesses, and investors; and cooperated closely with its international partners.
- Looking forward, the global financial crisis presents several additional challenges for the U.S. Government. Among them are the need to modernize financial regulation, unwind temporary programs in an orderly fashion, and develop long-term solutions for the government-sponsored enterprises (privately-owned, publicly-chartered entities) Fannie Mae and Freddie Mac.

Chapter 3: Energy and the Environment

Although fossil fuels will continue to constitute a large share of the Nation's energy portfolio for some time, the Administration has taken major steps to increase and diversify the Nation's energy supply and to improve the environment. Since 2001, significant investments have been made to develop cleaner and more reliable energy sources, and several regulatory changes are expected to deliver dramatic improvements in air quality nationwide. Chapter 3 reviews recent advances in energy and environmental policy and discusses several challenges associated with efforts to diversify the Nation's energy portfolio, to increase energy security, and to reduce emissions related to fossil-fuel based energy use. The key points of Chapter 3 are:

- Because of innovative regulations promulgated under this Administration, there should be substantial improvements in air quality over the next few decades. Two rules that implemented cap-and-trade programs in the electricity sector represent a significant step in using cost-effective, market-oriented policy instruments to dramatically reduce power plants' emissions of sulfur dioxide, nitrogen oxide, and mercury.
- Despite widespread support for using market-based approaches to achieve our environmental and energy policy goals going forward, challenges remain in realizing the full potential of these approaches.
- There is an increasing need to reassess how well existing laws can address the environmental problems associated with fossil fuel use in more cost-effective ways. For example, it may become increasingly costly to make additional reductions in traditional air pollutants, and existing statutes that focus on local or regional pollutants were not designed to address global problems such as greenhouse gas (GHG) emissions.
- Substantial reductions in global GHG emissions will require participation by all large emitters (countries and sectors within countries).

Chapter 4: The Benefits of Open Trade and Investment Policies

The United States has one of the most open economies in the world, ranking very high in common measures of openness to trade and investment. In the long run, the benefits that open economic policies generate far outweigh the narrow, short-run perceived benefits of protectionist or isolationist policies. The more diffuse but larger benefits of open trade and investment policies to the general economy are often difficult to discern, especially in the short run, and are sometimes obscured by the more visible effects of protectionist policies on favored groups. This chapter discusses several key facts about trade and investment in the United States, the benefits of free trade and open investment, and the policies that the United States has taken to enhance both. The key points of Chapter 4 are:

- Openness to trade and investment has boosted U.S. economic growth. Openness can also reduce the impact of shocks and increase the resilience of the U.S. economy.
- The number of U.S. free trade agreements has increased greatly during this Administration, and these agreements have contributed to the growth in U.S. exports.

- Portfolio and direct investments into the United States reached historic levels over the past decade, in part due to the depth, diversity, and openness of U.S. financial markets and the competitiveness of U.S. firms.
- The United States has maintained an open investment policy, facilitating foreign direct investment flows between the United States and the world while addressing legitimate national security concerns.
- U.S. development and trade initiatives, as well as U.S. engagement in multilateral institutions such as the World Trade Organization and the World Bank, have helped increase growth and foster political and economic stability in developing countries throughout the world.
- Continued commitment to open economic policies throughout the world will help ensure continued economic gains for the United States and the rest of the world.

Chapter 5: Tax Policy

Several policy changes over the past 8 years have resulted in lower tax rates for both individuals and businesses, and specific incentives have been established to reduce the adverse tax consequences of certain desirable activities, such as running a small business or buying an alternative-fuel vehicle. Lower tax rates have increased the benefit of working and investing; in particular, lower tax rates on dividends and capital gains helped business investment expand, thereby helping firms increase worker productivity. Tax relief has contributed to the solid economic growth and job creation that prevailed over most of the past several years. The expiration of these tax reductions would have serious consequences for the U.S. economy. An additional challenge is to further reduce business tax burdens to encourage business investment in the United States in order to develop new jobs for U.S. workers and to continue improving our standard of living. The key points of Chapter 5 are:

- Taxes alter individual and business incentives and thus have the potential to distort their behavior. This Administration consistently fought to reduce tax burdens on individuals and businesses; tax rates are now much lower than they were just 8 years ago.
- Tax reductions over the past 8 years have improved incentives to work, save, and invest.
- Globally, nations compete for businesses and the associated jobs; the United States may need to reduce tax rates on businesses to remain competitive in today's world.

- Future goals should include permanently extending the tax relief of the past 8 years and reforming the Alternative Minimum Tax.

Chapter 6: The Long-Run Challenges of Entitlement Spending

Federal spending on entitlement programs is expected to increase dramatically in the coming decades, particularly for Social Security, Medicare, and Medicaid. Taken together, these programs currently constitute 45 percent of Federal non-interest spending, and assuming no major changes to these programs, this share is projected to rise dramatically in coming decades. An aging population and rising health care spending per person are major reasons for these projected increases. The primary objective of this chapter is to highlight the budgetary challenges facing each of the three major entitlement programs and to outline possible strategies for addressing these challenges. The key points of Chapter 6 are:

- Federal entitlement spending is on an unsustainable path. Spending on the three major entitlement programs—Social Security, Medicare, and Medicaid—is projected to increase much faster than tax revenues or than the overall economy over the coming decades. Paying all scheduled benefits would eventually require substantial reductions in other Government spending, or major tax increases, or both.
- The aging population is a major cause of the expected increase, especially for Social Security, representing a permanent, as opposed to temporary, shift in the entitlement landscape. Currently, one out of six adults is age 65 or older; by 2020, one out of five adults will be 65 or older; and, by 2030, one out of four adults will be age 65 or older.
- The pay-as-you-go financing structure of Social Security, coupled with the aging population, creates a sizeable structural imbalance that will cause current and future generations of workers to bear increasing costs or receive smaller benefits than now scheduled, or both.
- Over the past 30 years, real per capita health care spending has grown considerably faster than real gross domestic product (GDP) per capita. Real growth in Medicare spending is being driven by increasing enrollment, greater utilization of more expensive high-technology medical treatments, and expansion of the goods and services covered by the program.
- Long-term care expenditures for low-income elderly and disabled persons represent a large and growing share of total Medicaid spending. The demand for long-term care is expected to grow in the United States

as a result of the aging population. In turn, this will place even greater financial strain on Federal and State budgets.

Chapter 7: Balancing Private and Public Roles in Health Care

Health care is one of the largest and fastest-growing sectors of the U.S. economy. While modern health care provides substantial benefits, there are growing concerns that its rising cost poses a threat to Americans' access to health insurance and medical care. The Administration has pursued several initiatives to encourage the efficient provision of health care through private markets and to improve access to affordable health care for individuals in the United States. This chapter provides an overview of U.S. performance with respect to the population's health status and spending on health care and discusses key efforts by the Administration to address issues of health care quality, cost, and access. The key points of Chapter 7 are:

- Health care spending is expected to grow rapidly over the next several decades, a trend that is driven by the increased use of high-technology medical procedures, comprehensive health insurance that decreases consumer incentives to shop for cost-effective care, rising rates of chronic disease, and the aging of the population in the United States.
- Markets for health care services can function more efficiently when payers, providers, and consumers have more complete information as well as incentives to use medical care that is clinically effective and of high value.
- Health insurance improves individuals' well-being by providing financial protection against uncertain medical costs and by improving access to care. Market-based approaches and innovative benefit designs can enable people to select coverage that best fits their preferences and to more actively participate in their own health care decision making.
- The Federal Government has an important role in investing in public health infrastructure, particularly with respect to improving the availability of community-based health care for the underserved, preparing for possible public health crises, supporting health-related research and development, and promoting global health improvement.

Chapter 8: Education and Labor

Long-term economic growth requires a productive workforce with the skills necessary to compete in a global labor market. The Administration's commitment to maintaining the high productivity of American workers is evident in successful education and training policies. A continued commitment to broader access to quality education and training will be required to meet the increasing worldwide demand for highly skilled labor. A workforce with better and more widely dispersed skills will ensure that workers enjoy higher incomes and will be a force in reducing income inequality in the United States. The United States also needs comprehensive reform of its immigration policies. The key points of this chapter are:

- Education benefits individuals through higher earnings, and it benefits society as a whole. Administration initiatives to improve kindergarten through twelfth-grade education, most notably the No Child Left Behind Act, are demonstrating clear, measureable results.
- Access to higher education was maintained through an expanded Pell Grant program and proactive efforts that helped protect Federally subsidized student loans from recent credit issues faced elsewhere in the economy.
- Despite a small decline in real median household income, which had begun prior to the Administration taking office, hourly earnings of workers outpaced inflation, and real per capita disposable income rose substantially during the past 8 years. Median household income increased steadily after the recovery began in earnest in 2004. Also, pension reforms were enacted to help protect retirement income.
- Income inequality and immigration reform must still be addressed. Strong support for education and a focus on workers' skills can help close income gaps. Reform of immigration policies must provide border security while allowing the economic benefits that immigrant labor provides to the economy.

Chapter 9: Economic Regulation

The private enterprise system, supported by consistent enforcement of laws protecting property and contracts, has been at the heart of the American economy's tremendous prosperity and growth. Although free markets produce the most efficient outcome in most cases, there are instances where government intervention can increase economic efficiency. Government regulation can improve economic outcomes where there are specific market failures that, for example, create negative externalities that impose costs on society or create harm from natural monopolies. At the same time, the Government's ability to create efficient regulation is limited and may create significant costs, which must be weighed against the potential benefits of addressing market failures. This chapter reviews several areas in which markets have been affected by Government policy in the past 8 years. The key points of this chapter are:

- Regulation is appropriate when, and only when, there is an important market failure that can be effectively addressed by the Government. For example, the Administration has taken steps to reduce restrictive regulation of broadband markets, preserving an environment conducive to innovation and new investment. Conversely, the Administration supported new rules for financial reporting when it became clear that existing laws did not adequately reduce information asymmetries between investors and management.
- When the Government intervenes to address market failures, it should attempt to take advantage of market-based incentives whenever possible. The Administration has helped ensure that scarce spectrum licenses are allocated more efficiently by increasing the amount of bandwidth allocated through auctions rather than through arbitrary allotments. In transportation, the Administration has supported market-based approaches to financing infrastructure such as roads and the air traffic control system.
- The Administration has endeavored to ensure that, when the government does intervene in markets, it does so in a way that supports the operation of competitive markets. When the market for terrorism insurance was disrupted following the attacks of 9/11, the Administration supported a temporary program of Federal support for terrorism insurance, and the Administration has insisted that subsidies be phased out as private insurers adapt and return to the market. By supporting tort reform, the Administration has helped reduce the scope for class action lawsuits that create costs that outweigh their social benefits.

CHAPTER 1

The Year in Review and the Years Ahead

Following 6 consecutive years of expansion of the U.S economy, the pace of real GDP expansion slowed in the first half of 2008 and turned negative in the second half. Payroll jobs began to decline in January, following a record 52 months of continuous growth. The observed pattern of output, employment, and other key indicators led the Business Cycle Dating Committee of the National Bureau of Economic Research to declare that the economy peaked in December of 2007, beginning a recession that continued throughout 2008. The reorientation of the U.S. economy—which had been underway in 2006 and 2007—away from housing investment and consumer spending and toward exports and investment in business structures continued through the first three quarters of 2008. However, the reorientation was neither smooth nor graceful, as falling house prices initiated a cascade of problems beginning with mortgage delinquencies and falling prices of mortgage-backed securities. This eventually threatened the solvency of several major financial institutions and ultimately resulted in several failures and forced mergers along with a major decline in the stock market beginning in late September. To respond to these problems, policymakers have undertaken a wide range of actions during the year, including: personal tax rebates and bonus depreciation allowances for business (the Economic Stimulus Act of 2008, enacted in February); support for the housing market (the Housing and Economic Recovery Act of 2008 in July); large-scale investment in financial assets (the Emergency Economic Stabilization Act of 2008 in October); a reduction in the Federal funds rate from 5¼ percent in August 2007 to almost zero by December 2008; and the implementation of a variety of programs by the Treasury, the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and other agencies to provide liquidity to financial institutions and to mitigate strains impairing the functioning of the overall financial system.

In the wake of mounting problems with the performance of *subprime* (higher risk) mortgages, financial markets became stressed beginning about August 2007 and became substantially more stressed after mid-September 2008. After a slight decline in real gross domestic product (real GDP, the total value of all goods and services produced in the United States after adjusting for inflation) in the fourth quarter of 2007, policy actions—including the enactment of a fiscal stimulus program and the initial round of Federal Reserve rate cuts—helped maintain positive real GDP growth in the first half of 2008. These actions likely delayed the downturn in output but were not sufficient to prevent the steep falloff in employment, production,

and aggregate spending that appears to have begun in mid-September. After the mid-September failure of Lehman Brothers (an investment bank), the emergency loans to AIG (an insurance company with extensive involvement in insuring mortgage-related securities), and the takeover of Washington Mutual (a savings bank with extensive mortgage-related assets), the global financial markets showed a sharp increase in perceived risk, and the stock market tumbled.

Inflation figures were mixed, with notable rises through mid-year in indexes that included food and imported energy products such as the consumer price index (CPI) and the price index for gross domestic purchases. A sharp decline in petroleum prices brought these prices down substantially by the end of the year. In contrast, inflation was less volatile for the broadest index of the goods and services produced in the United States (the GDP price index) and for most measures of wages and hourly compensation.

This chapter reviews the economic developments of 2008 and discusses the Administration's forecast for the years ahead. The key points of this chapter are:

- Real GDP likely declined over the four quarters of 2008, ending a 6-year run of positive growth, as the slow growth in the first half of the year was eclipsed by what appears to be a sharp decline in the fourth quarter.
- Financial distress, which first became evident in mid-2007 in the market for mortgage-backed securities (MBS), continued through 2008 and affected a variety of markets. In the wake of the failure and near-failure of several major financial institutions in September 2008, financial stresses increased sharply to levels not seen during the post–World War II era.
- Payroll jobs declined during 2008, having peaked in December of 2007. Employment losses averaged 82,000-per-month during the first 8 months of 2008 before accelerating to a 420,000-per-month pace during the next 3 months. The unemployment rate was at 5 percent though April—a low rate by historical standards—but increased to 6.7 percent in November. Initial and continued claims for unemployment insurance moved up sharply over the course of the year.
- Energy prices dominated the movement of overall inflation in the consumer price index (CPI), with large increases through July, followed by a sharp decline during the latter part of the year. Core consumer inflation (which excludes food and energy inflation) edged down from 2.4 percent during the 12 months of 2007 to a 1.9 percent annual rate during the first 11 months of 2008. Food prices rose appreciably faster than core prices.
- Nominal hourly compensation increased 2.8 percent during the 12 months through September 2008 (according to the employment cost index), a gain that was undermined by the rise in food and energy prices,

so that real hourly compensation fell 2 percent. In the long run, real hourly compensation tends to increase with labor productivity, although the correlation can be very loose over shorter intervals. Nonfarm business productivity has grown at an average annual rate of 2.6 percent since the business-cycle peak in 2001.

- An economic stimulus package was proposed by the President in January and passed by Congress in February, authorizing about $113 billion in tax rebate checks to low- and middle-income taxpayers and allowing 50 percent expensing for business equipment investment. The stimulus likely boosted GDP growth in the second and third quarters above what it might have been otherwise, but its influence faded by the end of the year.
- The Administration's forecast calls for real GDP to continue to fall in the first half of 2009, with the major declines projected to be concentrated in the fourth quarter of 2008 and the first quarter of 2009. An active monetary policy and Treasury's injection of assets into financial institutions are expected to ease financial stress and to lead to a rebound in the interest-sensitive sectors of the economy in the second half of 2009. Also supporting growth during 2009 is the substantial recent drop in petroleum prices, which offsets some of the effects of the recent decline in household wealth. The unemployment rate is expected to increase to an average of 7.7 percent for 2009. The expansion in 2010–11 is projected to be vigorous, bringing the unemployment rate down to 5 percent by 2012.

Developments in 2008 and the Near-Term Outlook

During the first three quarters of 2008, the economy continued the rebalancing that began in 2006, with strong growth in business structures investment and exports offsetting pronounced declines in homebuilding, while consumer spending edged lower by 0.6 percent at an annual rate. By the fourth quarter of 2008, however, most major indicators became sharply negative.

Consumer Spending and Saving

Real consumer spending stagnated in the first half of 2008 and then fell sharply in the third quarter in what was the largest quarterly decline since 1980. This was a major deceleration after the 2.8 percent average annual rate during the 2001–07 expansion. During these three quarters, motor vehicle purchases fell to 12.9 million units at an annual rate, a drop of 19 percent at an annual rate, having fluctuated around a 16-17 million unit average annual pace during the expansion. Energy purchases (which had edged up at

a 0.7 percent annual rate) declined at a 9 percent annual rate, finally reacting to the enormous increase in energy prices (relative to the price of the overall consumer basket) during the preceding 3 years. Other consumer spending (that is, outside of motor vehicles and energy) slowed to only a 1 percent annual rate of growth following a 3 percent average rate of growth during the preceding expansion. Consumer spending has continued to fall in the fourth quarter. Key factors influencing the evolution of consumer spending during the past year were the response to the multiyear increase in energy prices, the February stimulus package (see Box 1-1), and most importantly, the decline in household wealth during 2008.

Box 1-1: The Economic Stimulus Act of 2008

Policymakers moved quickly to address the slowing economy early in the year. The Federal Reserve cut the target Federal funds rate by 1¼ percentage points in January (following 1 percentage point of earlier cuts from August through December of 2007). The economic effects of monetary policy emerge more gradually then those of tax rebates, and so some fiscal stimulus from rebates was judged to be useful in supporting the economy in the short term. The Congress passed and the President signed the Economic Stimulus Act of 2008 in early February, only a few weeks after the President proposed it. The Act was designed to place money in the hands of those individuals and households who were most likely to spend it. The amount to be dispensed was about $113 billion, or about 0.8 percent of GDP. Most of the money was dispensed between late April and early July, with the bulk of the disbursements ($78 billion) in the second quarter.

Under this Act, the Treasury mailed checks ranging between $300 and $600 to taxpayers filing as individuals. Individuals who earned $3,000 (the minimum amount under this Act) received a $300 check; those who earned between $3,000 and $75,000 received a check for up to $600. The formula phased out the payments at a rate of $50 for every $1000 of income in excess of $75,000. (The figures for those filing as married couples were doubled.) Social Security and veterans payments were counted as earned income. The Act also included an allowance of $300 for each child (under the age of 17 as of the end of 2007). Those who did not qualify for payments based on their 2007 income could qualify based on their 2008 income, with the benefit to be paid in early 2009.

Some academic studies, however, suggest that individuals would realize that these checks were a one-time event and that they would choose to spend this windfall over many years. Other studies suggest that individuals, especially those who were credit-constrained, would

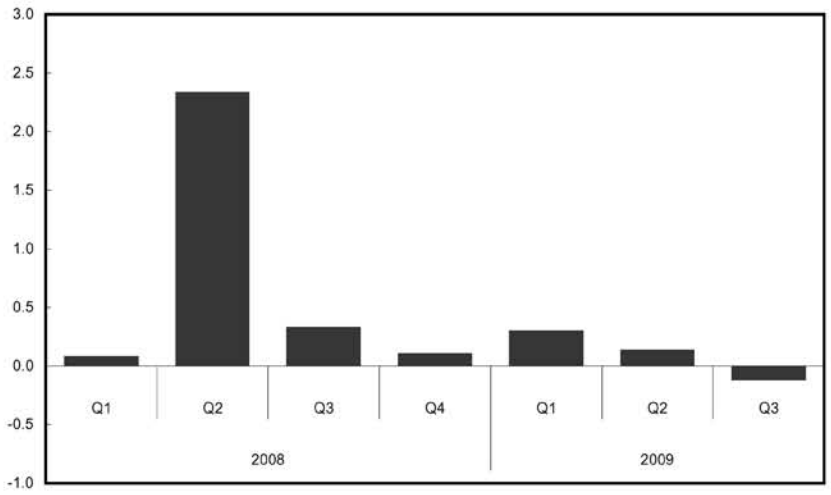
continued on the next page

Box 1-1 — continued

spend most of the money as it came in. A macroeconomic model simulated the expected boost to the profile of real GDP on the estimate that about 70 percent of the funds would be considered temporary income (to be spent over a long time) and the remaining funds would be regarded as immediately spendable. The profile from that simulation, which also showed the boost from bonus depreciation (discussed below), is shown in chart 1-1. The model simulation suggests a 2¼ percentage point boost to the annual rate of real GDP growth in the second quarter. Because many of the rebate checks were delivered late in the second quarter, however, some of the second-quarter stimulus shown in the chart was considered likely to spill over into the third quarter.

Boost to Quarterly Real GDP Growth from the 2008 Fiscal Stimulus

The Economic Stimulus Act of 2008 was expected to boost second- and possibly third-quarter growth.



Note: The nominal Federal Funds rate was held constant at baseline for the simulation.
Source: Council of Economic Advisers.

The Act also authorized businesses to deduct 50 percent of the cost of investment equipment installed during 2008 from their 2008 taxes, a policy that is often referred to as *bonus depreciation.* The Act also expanded the limits for small business expensing, a policy that was expected to boost real GDP growth by about 0.2 percentage point during 2008. Bonus depreciation is valuable only to firms with positive profits,

continued on the next page

Box 1-1 — continued

however, and so the fourth-quarter plunge in output will likely reduce the ability of firms to take advantage of this program.

Whether or not the fiscal stimulus produced the intended effect cannot be determined from observed macroeconomic data alone because the path that GDP would have taken without the stimulus remains unknown. However, a recent study that examined the nondurable purchases of a large sample of consumers found that the spending of individuals rose at the time rebate checks were received. The study concluded that the stimulus checks had a significant effect on purchases and that these effects were more pronounced among low-income consumers.

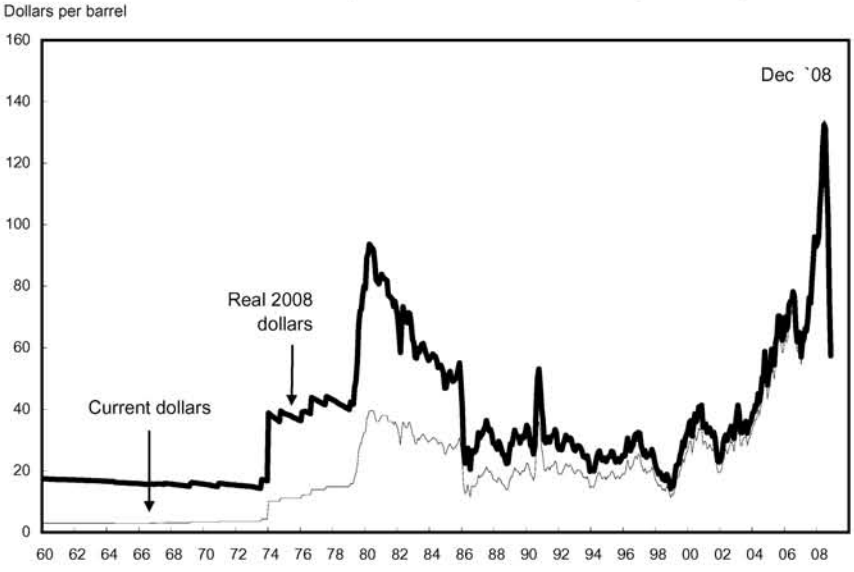
Energy Expenditures

Real energy consumption (that is, adjusted for increases in prices) increased slightly (4 percent) from 2001 through 2007, despite a cumulative 66 percent increase in the relative price of energy. The resulting increase in nominal energy spending through 2007 was not offset by a decline in nonenergy spending, and was one force that lowered the personal saving rate during these 6 years. As the relative price of energy increased another 15 percent during the first three quarters of 2008, real energy consumption finally fell 7 percent.

Oil prices skyrocketed to a peak monthly average of $134 per barrel in June for West Texas Intermediate (WTI) (a benchmark grade of crude oil), almost double the price of a year earlier. The sharp rise in the price of oil (see Chart 1-1) reflected roughly unchanged world oil production in the face of rapid global economic growth. More than half of the increase in world oil demand over the past 5 years is accounted for by China. Over that period, production increases in Brazil, China, Canada, the Sudan, and the former Soviet Union were mostly offset by a large decline in North Sea production and reductions in U.S. and Mexican production. By December the price of WTI oil had fallen to about $41 per barrel.

Because the U.S. imports about 3.7 billion barrels of oil per year, each $10-per-barrel increase adds about $37 billion to the national oil import bill. However, the economic consequences of the higher oil import bill during 2003–07 (when the price of WTI crude oil increased from a $31-per-barrel annual average to a $72-per-barrel annual average) were partially offset by an increase in demand for our exports (which grew at an average of 9 percent per year over this period). This increase in exports was partly a consequence of the same rise in foreign economic growth that caused the price of oil to increase. The additional $66-per-barrel increase in the price of oil from June

Chart 1-1 **Oil Prices: West Texas Intermediate**
Real oil prices reached record levels during the summer of 2008 before falling dramatically in the fall.



Note: Nominal oil prices were deflated with the PCE chain-type price index to arrive at real oil prices.
Sources: Wall Street Journal and Department of Commerce (Bureau of Economic Analysis).

2007 to June 2008 was larger than the entire increase during the preceding 4 years and added roughly $245 billion to the national import bill. This rise in cost was reversed by an even larger decline from June through December, with the price decline attributable to the drop in energy demand due to a worldwide decline in economic activity.

Wealth Effects on Consumption and Saving

The decline in value for housing wealth and, even more importantly, stock-market wealth were among the most important influences on consumer behavior during 2008. Changes in real wealth and real consumer spending are correlated, as can be seen in Chart 1-2. The interrelationship between wealth and consumer spending is far from perfect (at least in part because many other factors influence spending). The relationship is nevertheless statistically significant whether or not other related factors such as income and lagged values are included. Household wealth peaked in the second quarter of 2007, when it reached a level that was worth 6.3 years of disposable income. Housing and stock market wealth fell over the next five quarters; by the end of the third quarter of 2008 (the most recent official data available), the wealth-to-income ratio had fallen by 1.0 year of income. The continued stock market declines in October and November, together with the downward trend in house prices, suggest that the wealth-to-income ratio dropped

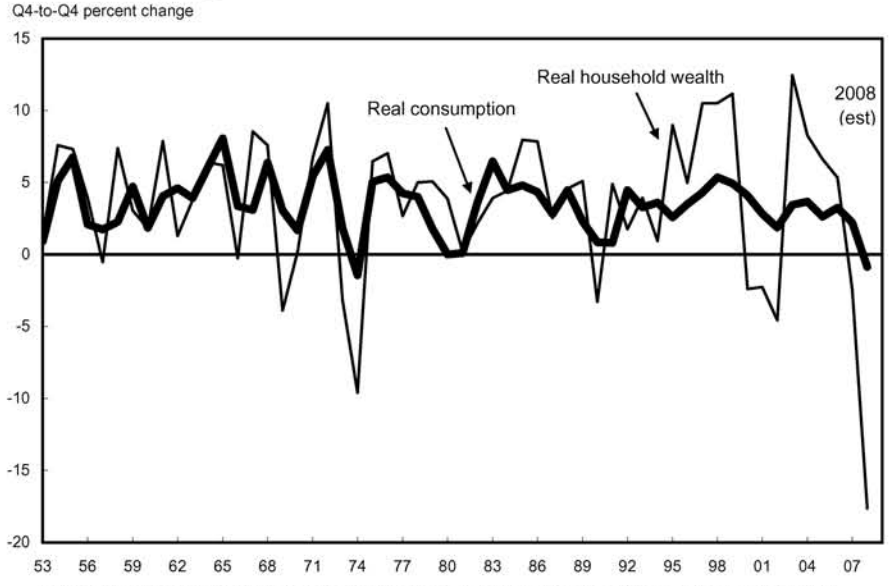
a further 0.5 year in the fourth quarter. As a result, the cumulative decline in the wealth-to-income ratio now appears to be about 1.5 years of income.

Most of the drop in household wealth is related to the stock market decline. In dollar terms, household net worth fell about $7 trillion between the second quarter of 2007 and the third quarter of 2008. Most of this decline was accounted for by the stock market, while the erosion of housing wealth was about one-half as large as that of the stock market. Other components of wealth (a category that includes consumer durables, credit market instruments, and equity in nonfinancial business, among others) were roughly unchanged over this five-quarter period.

Projected Consumer Spending

Consumer spending tends to rise and fall along with wealth (as illustrated in chart 1-2). A statistical analysis of the relationship between consumer spending, income, wealth, and other variables suggests that about 5 percent of wealth is spent every year. If this is so, the recent decline in the wealth-to-income ratio (of about 1.5 years of income) appears likely to reduce the consumption-to-income ratio and to raise the saving rate by roughly 7 percentage points over time. During the three years from 2005 to 2007, the saving rate averaged 0.5 percent, and so it appears that the saving rate will

Chart 1-2 **Real Consumption and Real Wealth**
Real consumer spending fluctuates with real wealth.



Notes: Data for the fourth quarter of 2008 are CEA estimates. Household wealth deflated by the PCE price index.
Sources: Department of Commerce (Bureau of Economic Analysis) and Federal Reserve Board.

probably move up gradually towards 7 percent—barring any sizable recovery in the stock market. A saving rate at this level would return the saving rate to the same level as for the 10-year period through 1985 (that is, before the run-up in the stock market in the late 1990s). To get there from the third quarter saving rate of 1.1 percent, however, would require substantially slower growth in consumer spending than in income. Thus, it seems likely that real consumer spending will continue to fall during the fourth quarter of 2008 and early in 2009. A rebound in the stock market would, of course, make this adjustment easier, as the saving rate would not have to rise by the full 7 percentage points. If a stock market rebound does not occur, consumption growth will likely remain weak into 2010.

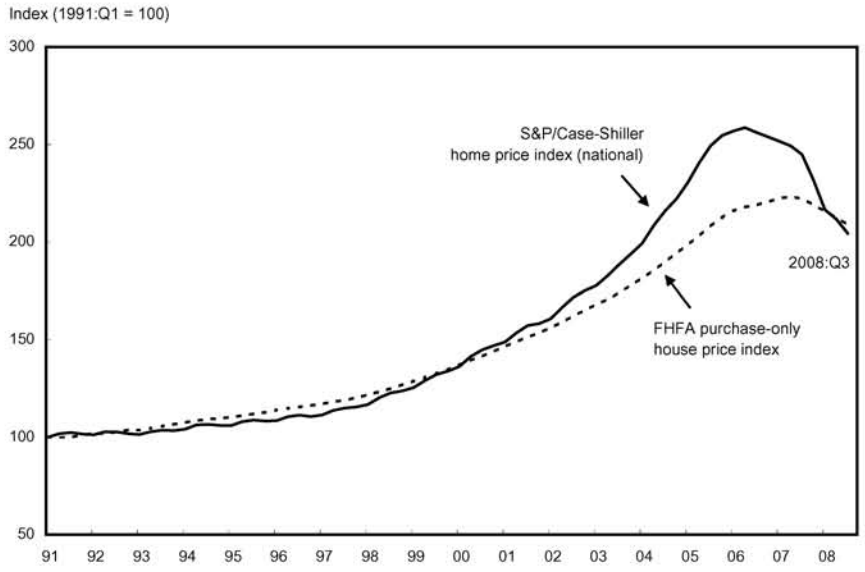
Residential Investment

Residential investment continued into its third year of decline in 2008. Major measures of housing activity moved lower over the course of the year, with housing starts falling to an average annual rate of 740,000 units during the three months through November, a huge decline from the 2.1 million unit annual rate at its peak in the first quarter of 2006. The drop in home construction now appears to have subtracted an average of 0.75 percentage point from the annual rate of growth of real GDP, similar to the subtraction during 2006 and 2007.

Housing prices peaked in the second quarter of 2007, as measured by the purchase-only index published by the Federal Housing Finance Authority (FHFA, formerly the Office of Federal Housing Enterprise Oversight). From that peak through the latest available data (the third quarter of 2008), housing prices have declined 6.5 percent (see Chart 1-3). According to the S&P/Case-Shiller index, which peaked earlier (in the second quarter of 2006) and subsequently declined 21 percent, the recent decline, as well as the earlier run-up, is more accentuated. (See Box 1-2 on the relative merits of the two house price indexes).

Further declines in home construction seem likely through at least the first half of 2009, as builders' confidence has fallen to the lowest level on record and the secondary market for housing-related securities continues to be thin. The Administration forecasts a steady uptrend in housing starts during the next 5 years, with the annual rate of starts gradually increasing so that by 2013 starts would reach 1.8 million units. This reflects, among other factors, a return to steady income growth, an easing of lending standards, and improved credit availability. The pace of the expected housing recovery has some upside risk. The number of unsold new houses has fallen to about 400,000 units, about the level of 2003 and 2004, even though the ratio of unsold new homes to the current selling pace remains near its record high. If and when aggregate demand accelerates, housing starts would easily be pulled upward.

Chart 1-3 **FHFA versus S&P/Case-Shiller Home Price Index**
Both house price indexes increased at an average rate of 5.5% per year from 2000 to 2008, but the Case-Shiller Index increased faster during 2000–06 and fell faster thereafter.



Sources: Federal Housing Finance Agency (FHFA) and S&P/Case-Shiller.

Box 1-2: Different Measures of House Prices

Both the FHFA purchase-only index and the S&P/Case-Shiller index have merit and use similar methods, but they cover different types of mortgages and have different regional coverage. As a result, each may have advantages in different contexts. Both are based on a methodology of observing pairs of sales of the same house over a span of years. The FHFA index is limited to homes purchased with conforming mortgages (that is, mortgages that conform to the maximum size and minimum downpayment standards set by Fannie Mae or Freddie Mac). In contrast, the S&P/Case-Shiller index collects data from a sample of homes that includes nonconforming as well as conforming mortgages. Each house gets an equal weight in the FHFA index, while more expensive houses are assigned larger weights in the S&P/Case-Shiller index. Of the two indexes, the FHFA index has the broadest national geographic distribution, while the Case-Shiller index has no data for 13 States and incomplete data for another 29 States.

continued on the next page

Box 1-2 — continued

The contrasting path of house prices as measured by these two indexes during the past decade is informative. By relying on conforming mortgages only, the FHFA index may provide a more stable picture of house prices during a period when the mix of mortgages changed toward the nonconforming types (subprime and jumbo, for example) and then back again. (This may be relevant if the type of mortgage is correlated with the price of the house.) On the other hand, the S&P/Case-Shiller index better illustrates the price path of all houses regardless of mortgage type and mortgage size. The contrast between the two indexes suggests that the runup in housing prices may have been larger for homes purchased with nonconforming mortgages and perhaps with jumbo mortgages. As the share of nonconforming mortgages fell sharply over the past 2 years, the two indexes are likely relying on more similar samples in 2008, and as a result, the recent larger decline in the S&P/Case-Shiller index may partly reflect a falling back to earth after having been temporarily elevated by higher prices for homes purchased with nonconforming mortgages. One study suggests that the inclusion of subprime mortgages in the S&P/Case-Shiller index accounts for a substantial share of the index's deeper decline. The larger increase and subsequently larger decline in the S&P/Case-Shiller index may also reflect larger price movements among more expensive homes.

Business Fixed Investment

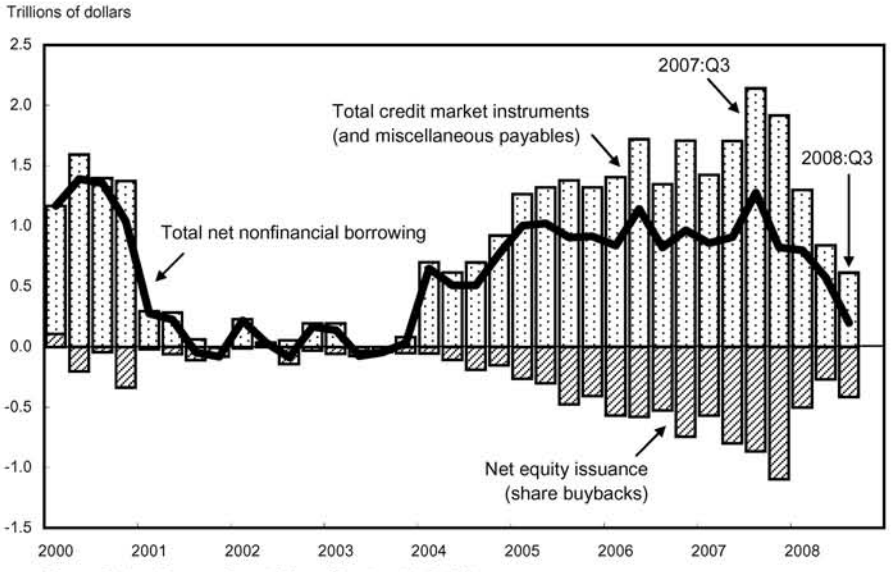
During the first three quarters of 2008, real business investment in equipment and software fell 4.4 percent at an annual rate, down from 2.8 percent growth in 2007. Growing categories included software (2.4 percent), communication equipment (5.2 percent), and agricultural equipment (27 percent), while investment in industrial equipment fell 4.0 percent. Investment in transportation equipment (which includes motor vehicles and aircraft) was particularly weak, falling 37 percent at an annual rate through the third quarter, with the sharpest drop seen in the light trucks category.

In contrast to residential investment, real business investment in nonresidential structures grew at a strong 12 percent annual rate through the third quarter of 2008. The gains during 2008 made it the third consecutive year of strong growth, which was a marked reversal from the weakness during the period from 2001 to 2005. Nearly 65 percent of total growth in nonresidential structures was accounted for by manufacturing structures and petroleum and natural gas exploration and wells.

Access to the credit markets to support investment became more difficult for nonfinancial corporations during 2008. The flow of new external funds (credit market instruments such as bond issues, commercial paper, and bank loans) in the fourth quarter of 2007 was about $1.9 trillion (the positive bars in Chart 1-4); it then fell by $1.3 trillion by the third quarter of 2008. Despite this drop in the flow of external funds, firms were able maintain solid investment by cutting back on programs to buy stock in their own company (by $700 billion, the negative bars in Chart 1-4) so that the total funds raised in all capital markets fell only $600 billion (the solid line in Chart 1-4). These share buyback programs had reached record levels during the period from 2004 through 2007. However, by the third quarter of 2008—when the major financial stress began—share buybacks had diminished to only $410 billion, so that this "source" of internal funds had been mostly exhausted.

Business investment growth is projected to decline in 2009, a projection that is based partially on the high level of interest rates on corporate bonds. It is also partially based on the pattern of business investment reacting to the change in output growth. That is, following the decline in output in late 2008, investment in 2009 is likely to fall. Later, the expected acceleration of real GDP in late 2009 and 2010 is expected to result in rapid growth of business investment. In the longer run, real business investment is projected to grow at about the same rate as real GDP.

Chart 1-4 **Nonfinancial Corporate Sector Net Borrowing by Type**
Loans and other credit market issues to nonfinancial corporations declined during 2008, but firms were able to cushion the effect on investment by scaling back their share buyback programs.



Source: Federal Reserve Board (Flow of Funds, table F.102).

Business Inventories

Inventory investment fell during the first three quarters of 2008 and had a noticeable influence on quarter-to-quarter fluctuations in real GDP, subtracting 1½ percentage points from growth in the second quarter. Inventories of motor vehicles on dealer lots were an important contributor to these fluctuations as these inventories were liquidated during the first half of 2008 and were increased slightly in the third quarter. Inventories of other goods outside of the motor vehicle sector were liquidated in each of the first three quarters of the year.

The overall ratio of inventories to sales has come down substantially since 2001. The inventory-to-sales ratio for manufacturing and trade (in current dollars) fell in the first half of 2008 before rising during the 3 months through October. Firms could soon find themselves with more inventory than they need if (as expected) sales continue to fall over the next few months. As a consequence, inventories are likely to be liquidated in the near term. Even so, a drop in inventory investment is not likely to be as dominant in the current downturn as it was in most of the post–World War II recessions because of the fairly lean inventory position relative to sales at the outset of this recession. In the long term, inventory investment is projected to be fairly stable, and the overall inventory-to-sales ratio is expected to continue to trend lower.

Government Purchases

Nominal Federal revenues (that is, in current dollars) fell 2 percent in fiscal year (FY) 2008, following 7 percent growth in FY 2007. The decline in revenues can be attributed partly to slowing economic growth (a key determinant of tax receipts), as well as reduced Federal tax revenues due to the tax rebate provisions of the Economic Stimulus Act of 2008. Coupled with declining revenues, a 9 percent increase in outlays resulted in an increase in the Federal budget deficit to 3.2 percent of GDP in FY 2008, up from 1.2 percent in FY 2007.

Through several appropriations acts, the Congress provided a total of $192 billion for the wars in Iraq and Afghanistan in FY 2008. One of these acts, the Supplemental Appropriations Act of 2008, also provided $68 billion in bridge funding for FY 2009.

Real State and local government purchases rose at a 1.2 percent annual rate during the first three quarters of 2008, down from 2.4 percent in 2007. State and local tax revenues slowed in 2008, as receipts from personal income taxes, sales taxes, and property taxes decelerated, while corporate tax receipts fell. Notably, property tax revenue, which had grown at a 6 percent annual rate each year in 2004, 2005, and 2006, slowed to a 2.6 percent annual rate of growth through the third quarter of 2008. Over the same period, receipts from sales taxes edged up only 0.1 percent at an annual rate.

The State and local government sector fell into deficit during 2008, reaching $109 billion or 0.8 percent of GDP, by the third quarter, the largest operating deficit on record. On average, State and local government operating budgets have been in surplus during the post–World War II period. In 2009 and 2010, only slow growth—if any—can be anticipated for this sector's consumption and gross investment. This decline results from the deterioration in their tax base, as reflected in falling home prices, declining consumer spending, and slowing growth in personal income. Property tax receipts and sales tax revenues each represent slightly more than 20 percent of State and local government revenues: Federal grants constitute another 20 percent; personal income tax receipts account for about 15 percent, while corporate tax collections constitute only 3 percent. A variety of fees, transfers, and incomes account for the remaining 18 percent.

Exports and Imports

Real exports of goods and services grew at a 7 percent annual rate during the first three quarters of 2008, following solid growth of at least 7 percent over the preceding 4 years. The rapid pace of export expansion over the past 5 years coincided with strong foreign growth from 2003 to 2007, as well as changes in the terms of trade between 2002 and mid-2008 that made American goods cheaper relative to those of some other countries. Recently, however, economic growth among our major trading partners has slowed considerably, with the Euro zone, Japan, and Canada posting negative growth. Because foreign growth and U.S. exports are closely related, the global economic slowdown will likely weigh on U.S. exports in the future.

By region, export growth during 2008 was strongest to Latin American countries, rising at a 24 percent annual rate through the third quarter. The European Union (EU) remains the major overseas destination for U.S. products and services, consuming about 25 percent of our exports. By country, Canada accounts for the largest share of U.S. exports, at about 16 percent. Mexico purchases 10 percent of our exports; Japan, 6 percent; and China, 5 percent.

Real imports fell at a 3.9 percent annual rate during the first three quarters of 2008; the last year of decline before that was 2001. The decline in real imports was especially pronounced among petroleum products, which fell 12 percent at an annual rate, pushed down by high prices and slowing domestic economic activity over this period. Due to rapidly rising petroleum prices through the first half of the year, nominal imports of petroleum products rose at a 46 percent annual rate. Oil prices have since receded dramatically, which will greatly reduce growth in nominal petroleum imports in coming quarters. Nonpetroleum import prices also increased substantially

(6.6 percent during the four quarters through the third quarter of 2008), which may also have restrained the level of imports.

The current account deficit (the excess of imports and income flows to foreigners over exports and foreign income of Americans) averaged 5.0 percent of GDP during the first three quarters of 2008, down from its 2007 average of over 5.3 percent. The decline in the current account deficit reflects faster growth in exports relative to imports, although domestic investment continues to exceed domestic saving, with foreigners financing the gap between the two.

Employment

The employment situation deteriorated during 2008, mirroring weakness in other sectors. The pace of job growth appears to have had two phases: a period of moderate job losses, at an average rate of 82,000 per month from January through August, followed by a steeper decline at an average rate of 420,000 per month in September, October, and November. Nonfarm payroll employment fell 1.9 million jobs during the first 11 months of the year. The unemployment rate rose 1.7 percentage points over the same period, reaching 6.7 percent. Initial claims for unemployment insurance rose to an average of about 550,000 per week in December, up from the 2007 average of 320,000 per week.

Job losses during the first 11 months of 2008 were concentrated in construction, manufacturing, and temporary help services. Although manufacturing and construction account for only about 15 percent of total employment, they accounted for nearly 60 percent of the overall decline in nonfarm jobs during 2008. Construction employment has been declining as a result of continued weakness in the housing market, and manufacturing employment has been on a downward trend as a share of overall employment for the past five decades. Temporary help services, which account for only 2 percent of employment, accounted for 21 percent of the year's job losses. Retailing also posted a notable decline. One bright spot in the employment picture has been education and health services, which added 505,000 jobs through November.

Changes in unemployment differed by education level, race, and gender over the year. Through November, the unemployment rate had risen for workers of all education levels; it increased 0.9 percentage point for those holding at least a bachelor's degree, 1.8 percentage points for those with some college, 2.1 percentage points for those whose education ended with a high school degree, and 2.9 percentage points among those who did not finish high school. By race and ethnicity, the unemployment rate for African Americans rose by 2.2 percentage points and was about 5 percentage points

above the rate for Caucasians, a smaller margin than during most of the past 35 years. The unemployment rate among Caucasians rose 1.7 percentage point, among Hispanics rose 2.3 percentage points, and among Asian Americans rose 1.1 percentage points. By gender, the jobless rate for adult men rose 2.1 percentage points to 6.5 percent, and the rate for adult women rose by 1.1 percentage point to 5.5 percent. The median duration of unemployment increased to 10.0 weeks in November from 8.4 weeks at the end of 2007. The number of long-term unemployed (those who are jobless for 15 weeks or more) rose by 1.4 million over the same period.

The Administration projects that employment will decline during the four quarters of 2009, with the job losses likely to be largest early in the year. As the expected recovery strengthens in 2010, job growth is anticipated to pick up to 222,000 jobs per month. In the longer run, the pace of employment growth will slow, reflecting diminishing rates of labor force growth due to the retirement of the baby-boom generation. The Administration also projects that the unemployment rate will increase from 2008 to a 7.7 percent annual average in 2009 as a whole, before returning to roughly 5 percent in 2012, the middle of the range consistent with stable long-run inflation.

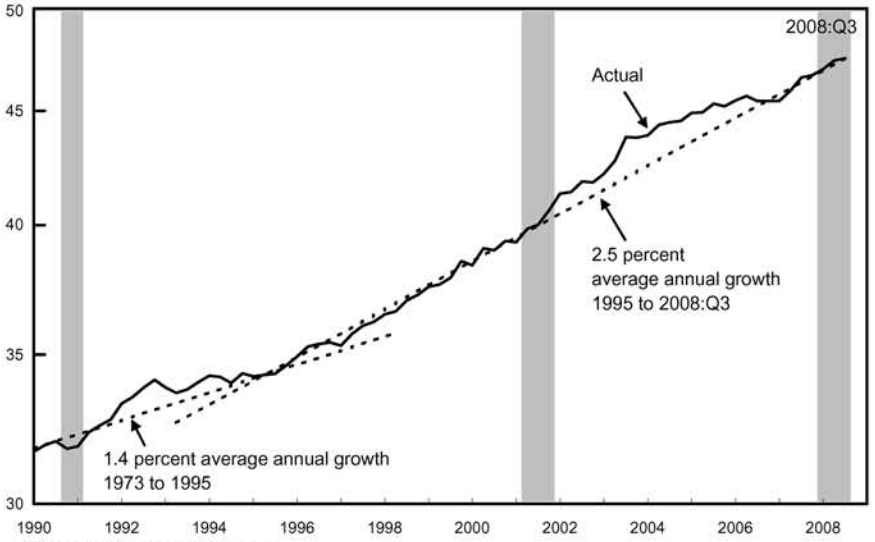
Productivity

Nonfarm productivity growth has averaged 2.5 percent at an annual rate since 1995 (see Chart 1-5). The best estimate of the productivity growth rate over the next 6 years is 2.4 percent, which is slightly below the 2.5 percent long-term (that is, post-1995) rate. Different measures of recent productivity growth are discussed in Box 1-3. Compared with last year's projection, this projected rate of growth has been revised down 0.1 percentage point. The downward revision is a consequence of the downward adjustment to output and productivity in the annual revision to the national income and product accounts.

Prices and Wages

Headline inflation rose and then fell during 2008, although key indicators of inflation trends were fairly stable. As measured by the overall consumer price index (CPI), the 12-month rate of inflation moved up to 5.6 percent for the 12 months through July, up from the 4.1 percent during the 12 months of 2007 (Chart 1-6). The acceleration was due to increases in food and energy price inflation. By November, however, the 12-month rate of overall CPI inflation had fallen to 1.1 percent. The 12-month change in the core CPI (which excludes the volatile food and energy components) fluctuated in a more narrow range, peaking at 2.5 percent during the third quarter, but edging down to 2.0 percent by November.

Chart 1-5 **Output per Hour in the Nonfarm Business Sector**
Productivity has trended up at an average annual rate of 2.5% since 1995.
Real output per hour (constant $2000, ratio scale)



Note: Shading indicates recessions.
Sources: Department of Commerce (Bureau of Economic Analysis) and Department of Labor (Bureau of Labor Statistics).

Box 1-3: Alternate Measures of Productivity Growth

Productivity growth can be projected by extrapolating its behavior over the recent past. But using which measure? According to the official index, which measures output from the product-side (spending) components of GDP, productivity growth picked up slightly from the 1995–2001 period (2.4 percent) to the 2001–08 period (2.6 percent at an annual rate), as shown in the following table. In contrast, an alternative measure of nonfarm output, derived from the income side of the national income and product accounts, shows a deceleration in productivity between the two periods to a 2.1 percent annual rate of increase over the period 2001–08. The income- and product-side measures of GDP differ by measurement error only, and the truth is likely to be somewhere in between. Both measures show a 2.5 percent annual average growth rate over the entire 1995–2008 interval.

continued on the next page

Box 1-3 — continued

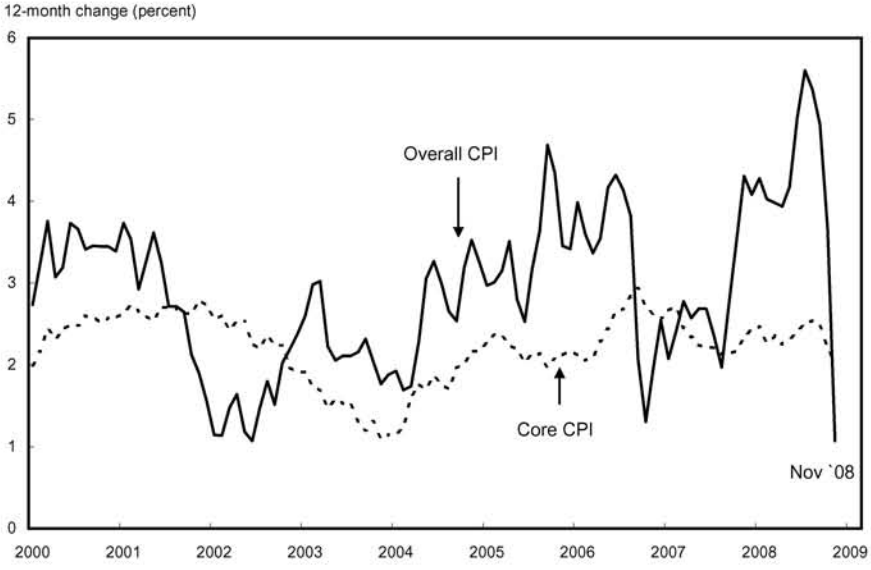
Productivity Growth in the Nonfarm Busines Sector: Income- and Supply-Side Measures

Interval	Average Annual Percent Change	
	Product-Side (official)	Income-Side
1995:Q2 to 2001:Q1	2.4%	3.1%
2001:Q1 to 2008:Q3	2.6%	2.1%
1995:Q2 to 2008:Q3	2.5%	2.5%

Sources: Department of Commerce (Bureau of Economic Analysis), Department of Labor (Bureau of Labor Statistics), income-side calculations by the Council of Economic Advisers.

Chart 1-6 **Consumer Price Inflation**

The increase in overall CPI inflation through mid-2008 was due to rising food and energy price inflation. A late 2008 drop in energy prices reversed much of the earlier increase. Core inflation was more stable.



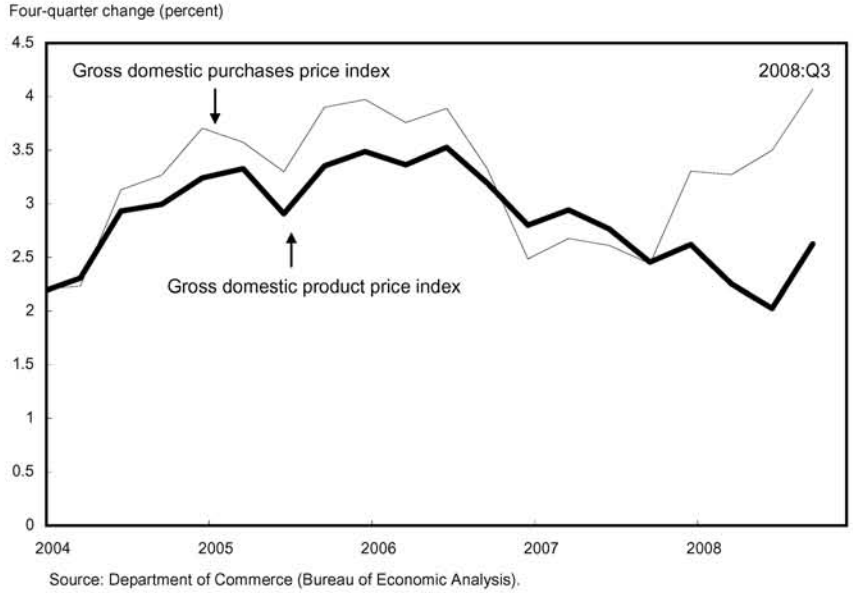
Source: Department of Labor (Bureau of Labor Statistics).

Energy prices increased rapidly in the second half of 2007 and in the early part of 2008 before peaking in July, when the 12-month rate of change reached 29 percent. Among the various energy products, prices of gasoline and heating oil increased the most rapidly during this period (reflecting the price of crude oil on world markets), but prices of electricity and natural gas also moved up sharply. Energy prices came down sharply during the 4 months from July to November, when consumer prices of petroleum products fell 41 percent (not at an annual rate). The rapid decline reflects the sharp fall in the price of crude oil; prices of West Texas Intermediate plunged from an average of $134 per barrel in June to roughly $41 per barrel in December.

Rapidly rising import prices were another factor boosting inflation early in the year and also holding it down later. Nonpetroleum import prices rose nearly 8 percent during the twelve months though July, before falling during the next 4 months. The pattern reflects the exchange value of the dollar, which depreciated in 2006, 2007, and during the first 3 months of 2008 before rebounding later in the year.

The effect of import prices appears clear in the contrast between the rate of inflation for the goods and services that Americans buy and the rate of inflation for what Americans produce (see Chart 1-7). The rate of inflation for the goods and services that Americans buy (measured by the price of gross domestic purchases) moved up from the year-earlier pace, in contrast to the less volatile rate of inflation for gross domestic product.

Chart 1-7 **Gross Domestic Product and Gross Domestic Purchases Price Indexes**
The price index for gross domestic purchases has increased more rapidly than the price index for gross domestic product over the past year due to rising prices for imported food and energy products.



Source: Department of Commerce (Bureau of Economic Analysis).

Food prices advanced notably faster than core prices for the second consecutive year. During the first 10 months of 2008, food prices increased 6.5 percent at an annual rate following a 5 percent increase during the 12 months of 2007. The increase was a worldwide phenomenon and likely reflects several factors, including rapid growth in developing countries in the first half of 2008, crop shortages and increased production of biofuels as well as higher energy prices being passed through to consumers.

Growth in nominal hourly compensation edged down slightly. Private-sector hourly compensation increased at a 2.6 percent annual rate during the first 9 months of 2008, down slightly from 3.1 percent during 2007. Slightly diminished gains in benefits as well as wages and salaries account for the deceleration. Gains in real hourly wages of production workers rose 3.4 percent at an annual rate during the first 11 months of the year, following a 0.7 percent decline during the 12 months of 2007, when nominal wage gains were undermined by rapidly rising food and energy prices.

Despite the relative stability of several key measures of inflation (hourly compensation, the core CPI, and the GDP price index), a measure of consumers' inflation expectations moved up and down during the year in a way that suggests that it was influenced by volatile energy and nonpetroleum import prices. One-year-ahead median inflation expectations (as measured by the Reuters-University of Michigan survey) rose from 3.4 percent at the end of 2007 to about 5 percent in midyear, before falling to 1.7 percent in December. Longer-term inflation expectations were less volatile but also moved up and then down in a similar fashion in the 2.6 to 3.4 percent range.

Financial Markets

The Wilshire 5000 (a broad stock market index) fell 39 percent during 2008, and the Standard and Poor (S&P) 500 (an index of the 500 largest corporations) suffered a similar decline. This decline erased the cumulated increases over the preceding 5 years. The Wilshire index slipped 16 percent through September 16, but then tumbled another 40 percent through November 20, before recovering a bit in late November and December. The S&P index of financial stocks fell by 57 percent in 2008.

Yields on 10-year Treasury notes ended 2007 at 4.10 percent—at the low end of the historical range—and fell another 170 or so basis points during 2008 with much of the decline coming in November and December. The low level of these long-term interest rates was due in part to a likely flight to the quality of these secure assets relative to others in the private and international markets during the recent market turmoil. Rates also fell toward the end of the year as market participants revised down the expected path of the Federal Reserve's target rate.

The Administration's forecast of short-term interest rates was roughly based on the expected path of Federal funds rates in the futures market (where participants place "bets" on future rates) as of November 10, the date that the forecast was developed. The near-term interest rate forecast has been overtaken by more recent events as interest rates have fallen notably since the forecast was finalized. Whatever the starting point, the Administration projects the rate on 91-day Treasury bills to edge up gradually to 3.9 percent by 2012 and then remain at that level. At that level, the real rate (that is, the nominal rate less the rate of inflation) on 91-day Treasury bills would be close to its historical average.

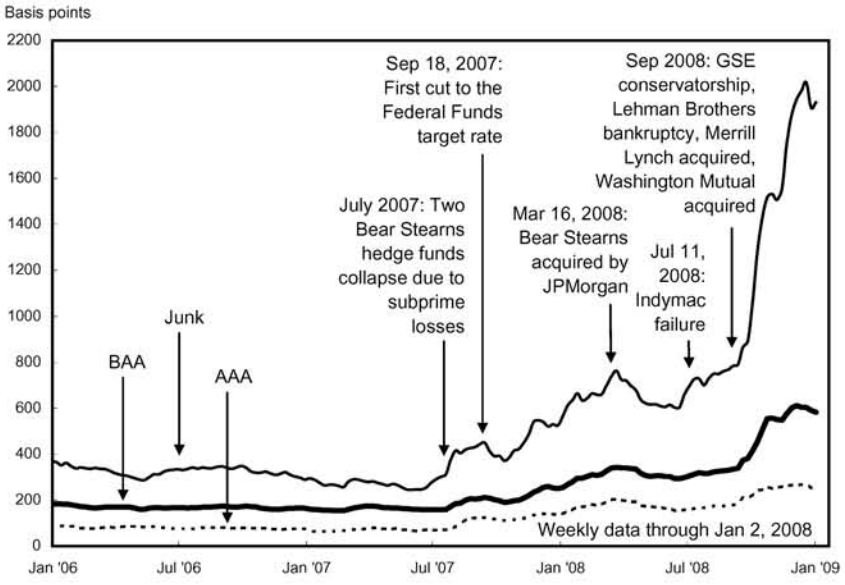
The yield on 10-year Treasury notes on November 10 was 3.8 percent. The decline in this yield during the subsequent month means that this near-term forecast has also been overtaken by events. The Administration expects the 10-year rate to increase, eventually reaching a normal spread of about 1.2 percentage points over the 91-day Treasury-bill rate by 2012. Market participants also appear to expect an increase in yield as evidenced by the higher-than-average spread between the rate on 20-year Treasury notes over rates on notes with 10-year maturities. As a result, yields on 10-year notes are expected to increase, to 5.1 percent by 2012 and then to plateau at this rate for the remainder of the forecast.

One measure of increasing financial stress is the premium that private borrowers have had to pay relative to the rates on 10-year government notes (see Chart 1-8). This premium began rising around August of 2007. Rates on the highest-quality corporate bonds have increased 170 basis points since August 2007. Rates on BAA-rated corporate borrowers have increased more than 400 basis points, while rates on high-risk ("junk") bonds have skyrocketed.

Financial stress also became evident in other ways. The rate that international banks lend to each other (as measured by the London interbank offered rate, LIBOR) soared to an unprecedented premium over Treasury rates beginning in September. For 3-month maturities, this premium that had averaged 114 basis points during the first 8 months of the year jumped to 273 basis points in the second half of September and remained high in October and November, but fell to 135 basis points by year-end. The Federal Reserve's survey of senior loan officers also shows a tightening of lending standards for all private borrowers.

One consequence of the rising spreads for corporate debt is that the sharp drop in the target Federal funds rate (from 5.25 percent in August 2007 to a range of 0 to 0.25 percent in December 2008) has not translated into lower rates for corporate borrowers. The rising rates for corporate bonds and the troubled market for interbank lending means that two major channels for monetary policy (lower interest rates to encourage investment and lower rates

Chart 1-8 **Corporate Bond Spreads**
Corporate bond yields have risen dramatically relative to 10-year Treasury-notes as a result of the credit crunch.



Sources: Moody's, Merrill Lynch, and the Treasury Department.

to boost consumer spending indirectly by raising the value of fixed income and equity assets) are not working as they have in the past. Chapter 2 of this *Report* discusses financial market developments in greater detail.

In view of how the stress in financial markets has interfered with the Federal Reserve's primary policy tool (the Federal funds rate), the Federal Reserve has responded by developing a range of programs to provide liquidity to support market functioning, thereby improving credit conditions for businesses and households. These include programs to provide liquidity directly to nondepository financial institutions (such as the Primary Dealer Credit Facility and the Term Securities Lending Facility) and programs to support the functioning of particular financial markets (such as the Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility, the Commercial Paper Funding Facility, and the Term Asset-Backed Securities Loan Facility). These programs are allowed under section 13-3 of the Federal Reserve Act, which authorizes the Federal Reserve banks to make secured loans to entities under "unusual and exigent circumstances," provided that these entities are not able to secure funding from other banking institutions. In addition, the Federal Reserve has announced programs to buy substantial quantities of securities, including direct obligations of, and mortgage-backed

securities issued by, the housing-related government-sponsored enterprises (GSEs). The Federal Reserve has also indicated that it is evaluating the potential benefits of purchasing longer-term Treasury securities.

The Long-Term Outlook Through 2014

After 6 years, the expansion ended in December 2007, and real GDP fell in the second half of 2008. Real consumer spending—a sector that constitutes two-thirds of GDP—is in the process of reacting to the substantial declines in wealth that began earlier in the year and cascaded in the fourth quarter. As a result, the Administration projects that after recording modest growth in the first half of 2008, real GDP contracted in the second half, with a sharp decline in the fourth quarter. The contraction is projected to continue into the first half of 2009, followed by a recovery in the second half of 2009 that is expected to be led by the interest-sensitive sectors of the economy. The overall decline, from the second-quarter level of GDP to the quarter with the lowest real GDP, is projected to slightly exceed the depth of the average post–World War II recession. This pattern translates into a small decline during the four quarters of 2008, followed by a small increase during 2009 (see Table 1-1). Reflecting the drop in real GDP, the unemployment rate is projected to increase to an annual average rate of 7.7 percent in 2009. The higher-than-normal level of slack is expected to put some downward pressure on the rate of inflation. Overall CPI inflation is projected at 1.7 percent in 2009 and 2010, a rate that appears plausible in view of the 2.0 percent change for the core CPI over the 12 months through November. Payroll employment is projected to fall during 2009 before rebounding in 2010. The 2009 forecasts for real GDP and inflation are similar to the consensus forecasts for those variables.

Downturns are eventually followed by recoveries, and historically the strength of a recovery appears to be loosely correlated with the depth of the preceding recession (see Chart 1-9). Moreover, the slope of the regression line in the scatter diagram indicates that—to the extent that a recession is deeper than the average—most of the excess depth is offset within the first four quarters of the recovery. During the 2 years following a recession, real GDP growth has averaged almost 5 percent, similar to the recovery anticipated in the Administration forecast for 2010 and 2011. The 5 percent growth rates in 2010 and 2011 would lower the unemployment rate from its projected 2009 peak to 5 percent, the center of the range consistent with stable inflation, in 2012.

Table 1-1.—*Administration Economic Forecast*[1]

Year	Nominal GDP	Real GDP (chain-type)	GDP price index (chain-type)	Consumer price index (CPI-U)	Uemploy-ment rate (percent)	Interest rate, 91-day Treasury bills[2] (percent)	Interest rate, 10-year Treasury notes (percent)	Nonfarm payroll employ-ment (average monthly change, Q4-to-Q4, thou-sands[3]
	Percent change, Q4-to-Q4				Level, calendar year			
2007 (actual).....	4.9	2.3	2.6	4.0	4.6	4.4	4.6	104
2008.....	2.4	-0.2	2.5	2.8	5.7	1.4	3.8	-114
2009.....	2.2	0.6	1.7	1.7	7.7	0.7	4.2	-235
2010.....	6.6	5.0	1.5	1.7	6.9	2.0	4.6	222
2011.....	6.5	5.0	1.5	1.8	5.8	3.5	4.9	269
2012.....	5.1	3.4	1.6	1.9	5.0	3.9	5.1	261
2013.....	4.5	2.7	1.7	2.0	5.0	3.9	5.1	121
2014.....	4.5	2.7	1.8	2.1	5.0	3.9	5.1	115

[1] Based on data available as of November 10, 2008.

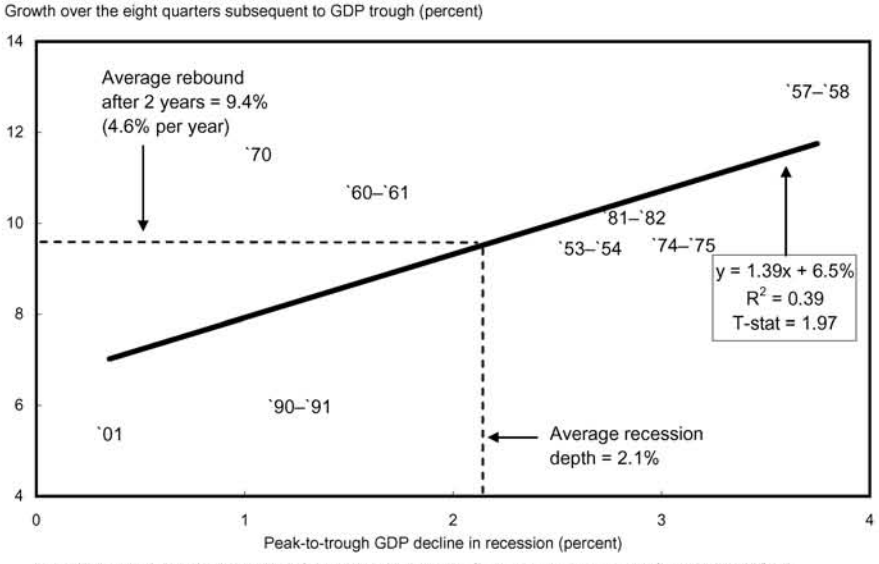
[2] Secondary market discount basis.

[3] The figures do not reflect the upcoming BLS benchmark which is expected to reduce 2007 and 2008 job growth by a cumulative 21,000 jobs.

Sources: Council of Economic Advisers, Department of Commerce (Bureau of Economic Analysis and Economics and Statistics Administration), Department of Labor (Bureau of Labor Statistics), Department of the Treasury, and Office of Management and Budget.

Chart 1-9 **Recessions and Recession Recoveries**

GDP growth over the eight quarters following a recession tends to be higher after more severe recessions.



Note: Datapoint labels indicate year of recession. The depth of recession is meausured from the peak GDP quarter to the minimum GDP quarter. The recovery is the eight-quarter growth from that minimum-GDP quarter.
Source: Department of Commerce (Bureau of Economic Analysis).

Growth in GDP over the Long Term

The Administration forecast is based on a projection that sees the U.S. economy fluctuating around a long-run potential rate of growth of 2.7 percent. (*Potential real* GDP growth is a measure of the sustainable rate of growth of productive capacity.) The path of real GDP growth in the current downturn and projected recovery fluctuates around this long-term trend.

Over the next 6¼ years, real GDP growth is projected to increase 2.9 percent (see Table 1-2), a growth rate that is faster than the 2.7 percent long-term rate because the current level of the unemployment rate has considerable room to fall before the economy is again operating at its potential. Real GDP growth in 2013 and 2014, at 2.7 percent, is almost identical to the consensus projection of long-run growth.

The growth rate of the economy over the long run is determined by its supply-side components, which include population, labor force participation, the ratio of nonfarm business employment to household employment, the length of the workweek, and labor productivity. The Administration's forecast for the contribution of the growth rates of different supply-side factors to real GDP growth is shown in Table 1-2.

Over the next 6 years, the working-age population (line 1) is projected to grow 1.0 percent, the rate set in the Census Bureau's newly revised projection. The labor force participation rate (line 2), which edged down at a 0.2 percent annual rate during the past 8 years, is expected to decline even faster (0.3 percent per year) during the projection period. The further projected deceleration is a consequence of the aging baby-boom generation (born between 1946 and 1962) entering their retirement years. For example, the 1946 birth cohort reached the early-retirement age of 62 in 2008. Over long periods of time the employment rate (defined as 100 less the unemployment rate) is usually stable, but the elevated jump-off level of the unemployment rate makes room for some growth in this component (line 4). The ratio of nonfarm business employment to household employment (line 6), which has accounted for a puzzling subtraction from real GDP growth since 2001, is projected to edge down only slightly (0.1 percent per year) over the projection interval. The workweek (line 8) is projected to edge up slightly, in contrast to its general decline over the past 50 years. The slight upward tilt is projected to be a labor market reaction to buffer labor supply against the projected falling rates of labor force participation. Productivity growth (line 10) is projected to grow 2.4 percent, our best estimate of the trend rate of growth during the recent business cycle (accounting for some measurement issues, as noted earlier). The ratio of real GDP to nonfarm business (line 12) is expected to continue to subtract from overall growth as it has over most long periods.

TABLE 1-2.—*Supply-Side Components of Real GDP Growth, 1953-2014*
[Average annual percent change]

	Item	1953 Q2 to 1973 Q4	1973 Q4 to 1995 Q2	1995 Q2 to 2001 Q1	2001 Q1 to 2008 Q3	2008 Q3 to 2014 Q4
1)	Civilian noninstitutional population aged 16+[1]	1.6	1.4	1.2	1.2	1.0
2)	PLUS: Civilian labor force participation rate	0.2	0.4	0.1	-0.2	-0.3
3)	EQUALS: Civilian labor force[2]	1.8	1.8	1.4	1.0	0.8
4)	PLUS: Civilian employment rate	-0.1	0.0	0.3	-0.2	0.2
5)	EQUALS: Civilian employment[2]	1.7	1.8	1.6	0.7	0.9
6)	PLUS: Nonfarm business employment as a share of civilian employment[2,3]	-0.1	0.1	0.4	-0.6	-0.1
7)	EQUALS: Nonfarm business employment[4]	1.6	1.9	2.0	0.1	0.8
8)	PLUS: average weekly hours (nonfarm business)	-0.3	-0.3	-0.2	-0.3	0.1
9)	EQUALS: Hours of all persons (nonfarm business)[4]	1.3	1.6	1.9	-0.1	0.9
10)	PLUS: Output per hour (productivity, nonfarm business)[4]	2.5	1.5	2.4	2.6	2.4
11)	EQUALS: Nonfarm business output[4]	3.8	3.1	4.3	2.5	3.3
12)	PLUS: Ratio of real GDP to nonfarm business output[5]	-0.2	-0.2	-0.5	-0.2	-0.4
13)	EQUALS: Real GDP	3.6	2.8	3.8	2.3	2.9

[1] Adjusted by CEA to smooth discontinuities in the population series since 1990.

[2] BLS research series adjusted to smooth irregularities in the population series since 1990.

[3] Line 6 translates the civilian employment growth rate into the nonfarm business employment growth rate.

[4] Nonfarm employment, workweek, productivity, and output sourced from the BLS productivity and cost database.

[5] Line 12 translates nonfarm business output back into output for all sectors (GDP), which includes the output of farms and general government.

Note: 1953 Q2, 1973 Q4, and 2001 Q1 are NBER business-cycle peaks.

Detail may not add to total because of rounding.

Sources: Council of Economic Advisers, Department of Commerce (Bureau of Economic Analysis) and Department of Labor (Bureau of Labor Statistics).

A Perspective on the Past Eight Years

The past 8 years began with a mild recession and then shifted into a slow-growth recovery that only gradually gained momentum. Throughout the first 7 years, consumer spending provided a solid base for economic growth, and that base was fortified by housing investment. As residential construction fell in 2006 and 2007, it was replaced by export growth as a major contributor to overall GDP growth. In 2008, the combination of falling construction, losses in housing-related securities, rising oil prices, and a falling stock market eventually tipped the economy into recession. Inflation as measured by the four-quarter change in the price index for GDP fluctuated between 1.6 and 3.5 percent, a fairly narrow range in a broad historical context.

The economy showed signs of slowing in 2000: the dot-com bust was already underway, and GDP growth in the third quarter of 2000 was negative. In response to the incipient downturn, the Federal Reserve slashed its target rate early in January 2001. The economy began to shed jobs steadily

in March 2001. The Administration and Congress responded proactively with EGTRRA (The Economic Growth and Tax Relief Reconciliation Act of 2001) which delivered about $36 billion of stimulus checks in 2001 and phased in cuts in marginal tax rates over several years. The recession of 2001 was particularly severe in business investment, a demand component that had been particularly strong in preceding years. Low interest rates during this period boosted demand for housing and consumer durables, both of which were substantially stronger than during an average recession. The recession of 2001 was exacerbated by the terrorist attacks of September 11, and several widely publicized accounting scandals also contributed to the economic uncertainty of the time. All told, however, the 2001 recession turned out to be the shallowest of the post–World War II period (the most that real GDP declined in a single quarter during the recession was 0.4 percent), with some of the credit attributable to the quick action of monetary and fiscal policy.

The unemployment rate continued to rise following the official end of the recession. To address the lagging recovery, the Administration and Congress instituted JCWAA (the Job Creation and Worker Assistance Act), which allowed firms to expense 30 percent of their equipment investment and extended unemployment compensation to laid-off workers, and JGTRRA (the Jobs and Growth Tax Relief Reconciliation Act), which boosted the expensing rate on investment to 50 percent and extended the duration of this provision. JGTRRA also cut the tax rate on dividends and capital gains. These Acts helped speed up economic growth soon after their implementation. The relative strength of the U.S. economy, evident in the demand for imports and in foreigners' desire to invest in the United States, helped maintain world demand during this early-recovery period. It also resulted in a large increase in the U.S. current account deficit.

Late in 2003, the economy shifted from a period of slow recovery to a period of broad economic expansion, marked by a decline in the unemployment rate and rapid growth in economic activity. The recovery was led by robust growth in consumer spending, equipment and software investment, exports, and residential construction, and coincided with spectacular house price appreciation. With the benefit of hindsight, house prices climbed too high. As home prices began to recede beginning in early 2006, so did the pace of housing starts. Housing starts continued to decline over the next 2½ years, eventually reaching an all-time low in November 2008.

During 2006 and 2007, rapid export growth and growth in investment of nonresidential structures replaced residential investment as the main drivers of aggregate demand. The economies of our trading partners, especially those in developing countries, picked up and boosted the demand for our exports—and also boosted the demand for petroleum. The rise in petroleum prices, which moved up again toward the end of 2007, added to the cascade of problems caused by falling house prices.

Although growth slowed to a crawl in early 2008 and employment edged down, fiscal stimulus and monetary policy actions held real GDP growth in generally positive territory through the first half of the year. The sharp declines in consumer spending in the third quarter and the stock market drop in September and October finally confirmed that the decline was a recession.

Until the second half of 2008, the economy was resilient, weathering many shocks including the 2001 recession, the terrorist attacks of September 11, some widely publicized accounting scandals, and the 2005 and 2008 hurricanes. The most damaging event was the decline in the housing market that began in early 2006. Even after the onset of the housing market decline, however, real GDP growth remained positive until the fourth quarter of 2007.

The business-cycle expansion lasted 73 months, the fourth longest post-World War II expansion. The growth rate of real GDP per labor force participant averaged 1.5 percent at an annual rate from the business-cycle peak in 2001 to the business-cycle peak in the fourth quarter of 2007, identical to its average growth over the period from 1953 to 2001.

Conclusion

The economy was weakening as it entered 2008, but was temporarily sustained at generally positive growth by the 2008 fiscal stimulus package and monetary policy actions. Consumer spending declined sharply in the third quarter, and mounting stress in financial markets reached a crescendo in September, triggering a decline in stock market wealth that further reduced consumer spending. Because of the large declines in wealth from September to December, the saving rate is likely to rise in 2009, which will continue to cause a decline or slow growth in consumer spending. The large September to December declines in wealth imply that an upward movement of the saving rate is likely in 2009, with further constraint on consumer spending as the increase plays out. The monetary and financial agencies of the Government have recently been particularly active with the Federal Reserve implementing a variety of new programs to provide liquidity to financial institutions and to support the functioning of financial markets. The Treasury, empowered by the recently passed Emergency Economic Stabilization Act, has also been active over this period and has strategically allocated funds to support financial sector solvency and liquidity (discussed in more detail in Chapter 2). These vigorous measures are expected to increase confidence in the financial sector over the next several months, leading to a rebound in output sometime in 2009.

Beyond the next few years, the economy is projected to settle into a steady state in which real GDP grows at about 2.7 percent per year, the unemployment rate stays around the level consistent with stable inflation (about 5.0 percent) and inflation remains moderate and stable (about 2.1 percent on the CPI). Economic forecasts are subject to error, and unforeseen positive and negative developments will affect the course of the economy over the next several years. Given the economy's strong basic structure (that is, free mobility of labor, relatively low taxes, and openness to trade), prospects for a resumption of steady growth in the years ahead remain good. Later chapters of this *Report* explore how market-based reforms and pro-growth policies such as tax reform and open commerce can enhance our economic performance.

CHAPTER 2

Housing and Financial Markets

In the summer of 2008, the disruptions in credit markets that began in 2007 worsened to the point that the global financial system was in crisis. The crisis was sparked by substantial declines in house prices, rising default rates on residential mortgages, and a resulting sharp decline in the value of mortgages and mortgage-backed securities, in part created by excesses in the mortgage market. These assets were held by institutions that play a vital role in the functioning of financial markets.

Many of those institutions were vulnerable to these losses because they were highly levered and, in particular, were highly dependent on short-term funding. In other words, those institutions had borrowed extensively against their long-term assets, and a large part of their debt was short-term, so that their existing debt needed to be paid off and replaced with new short-term debt with some frequency. As their losses mounted, those firms attempted to deleverage by selling assets or raising new capital. But several major firms failed in these efforts, either because their losses made them fundamentally insolvent or because their reliance on short-term funding did not give them enough time and flexibility to strengthen their financial positions.

The failure and near-failure of these firms, combined with broad-based declines in asset prices, including assets with little or no relationship to the mortgage market, placed enormous stress on world financial markets. Credit markets froze, and confidence in the financial system eroded. The Federal Reserve and the Administration acted aggressively to restore stability to the U.S. financial system; the Federal Reserve injected massive amounts of liquidity into the markets through existing and new facilities, and the Administration took several actions, including the creation of new authorities under the Emergency Economic Stabilization Act of 2008 (EESA). These unprecedented efforts laid the foundation for a recovery in credit markets.

The key points of this chapter are:

- The roots of the current global financial crisis began in the late 1990s. A rapid increase in saving by developing countries (sometimes called the "global saving glut") resulted in a large influx of capital to the United States and other industrialized countries, driving down the return on safe assets. The relatively low yield on safe assets likely encouraged investors to look for higher yields from riskier assets, whose yields also went down. What turned out to be an underpricing of risk across a number of markets (housing, commercial real estate, and leveraged buyouts, among

others) in the United States and abroad, and an uncertainty about how this risk was distributed throughout the global financial system, set the stage for subsequent financial distress.

- The influx of inexpensive capital helped finance a housing boom. House prices appreciated rapidly earlier in this decade, and building increased to well-above historic levels. Eventually, house prices began to decline with this glut in housing supply.
- Considerable innovations in housing finance—the growth of subprime mortgages and the expansion of the market for assets backed by mortgages—helped fuel the housing boom. Those innovations were often beneficial, helping to make home ownership more affordable and accessible, but excesses set the stage for later losses.
- The declining value of mortgage-related assets has had a disproportionate effect on the financial sector because a large fraction of mortgage-related assets are held by banks, investment banks, and other highly levered financial institutions. The combination of leverage (the use of borrowed funds) and, in particular, a reliance on short-term funding made these institutions (both in the United States and abroad) vulnerable to large mortgage losses.
- Vulnerable institutions failed, and others nearly failed. The remaining institutions pulled back from extending credit to each other, and inter-bank lending rates increased to unprecedented levels. The effects of the crisis were most visible in the financial sector, but the impact and consequences of the crisis are being felt by households, businesses, and governments throughout the world.
- The U.S. Government has undertaken a historic effort to address the underlying problems behind the freeze in the credit markets. These problems, the subject of much of this chapter, are a sudden increase in the desire for liquidity, a massive reassessment of risk, and a solvency crisis for many systemically important institutions. The Government has worked to preserve the stability of the overall financial system by preventing the disorderly failures of important financial institutions; taken unprecedented action to boost liquidity in short-term funding markets; provided substantial new protections for consumers, businesses, and investors; and cooperated closely with its international partners.
- Looking forward, the global financial crisis presents several additional challenges for the U.S. Government. Among them are the need to modernize financial regulation, unwind temporary programs in an orderly fashion, and develop long-term solutions for the government-sponsored enterprises (privately-owned, publicly-chartered entities) Fannie Mae and Freddie Mac.

Origins of the Crisis

The roots of the global financial crisis can be traced back to before the beginning of this decade and were, in part, caused by a rise in saving by developing economies.

The Global Saving Glut

Countries in Asia and the Middle East started saving enormous sums in the late 1990s. This increase in saving was primarily due to two factors. First, a number of developing countries experienced financial crises in the 1990s. As these crises abated, these countries began accumulating extensive savings as a buffer against any future crises. Second, sharp increases in oil prices over the past few years generated large revenues for oil exporters, including Russia, Nigeria, Venezuela, and countries in the Middle East. With productive economies and strong legal regimes, the United States and other industrialized countries attracted a good portion of that saving, and foreign investors purchased low-risk assets such as Treasury bonds, debt issued by government-sponsored enterprises Fannie Mae and Freddie Mac, and mortgage-backed securities, as well as riskier assets. From 1996 to 2007, industrialized countries went from a current account surplus (recording a surplus in net trade in goods and services, and net income and transfers from abroad) of $14 billion to a current account deficit of almost $500 billion. At the same time, developing countries went from a current account deficit of $82 billion to a surplus of $760 billion.

As this influx of capital became available to fund investments, interest rates fell broadly. The return on safe assets was notably low: the 10-year Treasury rate ranged from only 3.1 percent to 5.3 percent from 2003 to 2007, whereas the average rate over the preceding 40 years was 7.5 percent. While to some extent the low rates reflected relatively benign inflation risk, the rate on risky assets was even lower relative to its historical average: the rate on a 10-year BAA investment-grade (medium-quality) bond ranged from only 5.6 percent to 7.5 percent from 2003 to 2007, whereas the average over the preceding 40 years was 9.3 percent. The net effect was a dramatic narrowing of *credit spreads.* A credit spread measures the difference between the yield on a risky asset, such as a corporate bond, and the yield on a riskless asset, such as a Treasury bond, with a similar maturity. Risky assets pay a premium for a number of reasons, including liquidity risk (the risk that it will be difficult to sell at an expected price in a timely manner) and default risk (the risk that a borrower will be unable to make timely principal and interest payments).

Credit spreads declined as these premiums shrank. From 2003 to mid-2007, for example, credit spreads on junk bonds fell by 5.5 percentage

points, to a historical low of 2.4 percent. Credit spreads on AAA (high-quality) and BAA investment-grade bonds also fell over this time period. (See Chart 1-9 in Chapter 1.) While some market participants may have argued that declining credit spreads reflected an actual decline in the level of risk, we see in hindsight that many of these assets continued to be quite risky. Declining spreads reflected, at least in part, a temporary increase in demand for risky but higher-yielding assets. The underpricing of risk across a number of markets—including housing, commercial real estate, and leveraged buyouts—in the United States and abroad set the stage for a subsequent financial crisis.

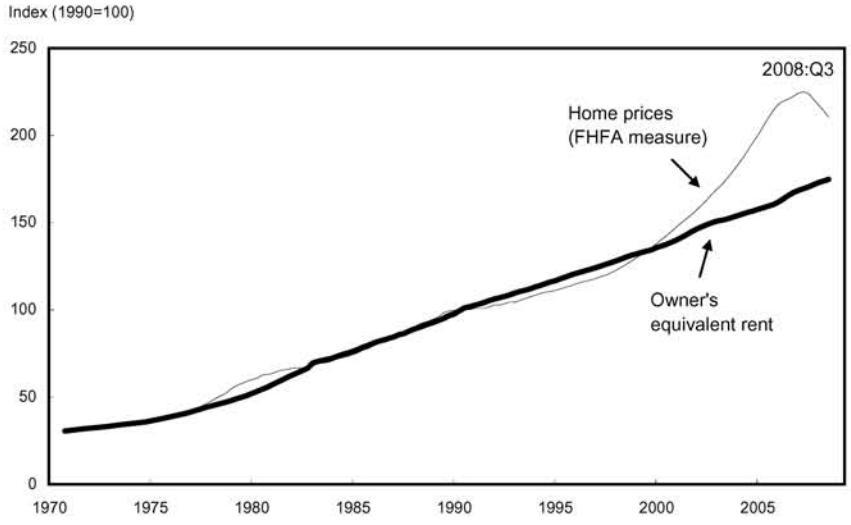
The Global Credit Boom and the Housing Market

The underpricing of risk made loans readily available to borrowers, especially to riskier borrowers, and gave rise to a global credit boom. At the epicenter of the global credit boom was the U.S. residential housing market. During the credit boom, the ease of credit financing encouraged rapid increases in demand for housing, leading to extraordinary house price increases. According to the S&P/Case-Shiller National Index, house prices increased by 11 percent in 2002, 11 percent in 2003, 15 percent in 2004, and 15 percent in 2005—stunning rates by historical standards. The Federal Housing Finance Agency (FHFA) purchase-only price index, which covers only homes purchased with conforming mortgages (that is, it excludes both subprime and large "jumbo" mortgages), rose more moderately but still climbed an impressive 9 percent in 2004 and 9 percent in 2005 (see Chart 2-1).

Measures of long-term balance in the housing market, such as the ratio of home prices to rents, reached record highs over this period. The components of this ratio are shown in Chart 2-1. As home prices rose much faster than rents after 2000, the ratio (not shown) of the two lines climbed beyond its historical range. This ratio had remained relatively stable from 1982 to 1999, but as house prices began to climb, the ratio of prices to rents soared to unprecedented heights, suggesting that owner-occupied housing became more expensive relative to rental housing.

In addition to expanded credit availability, the price increases reflected a number of other factors, such as income growth and extremely optimistic expectations about future house price gains. All of these factors likely increased demand for housing, which put upward pressure on house prices. Dramatic house price increases encouraged well-above-average residential investment and a decline in underwriting standards in the mortgage market.

Chart 2-1 **Home Prices and Owner's Equivalent Rent**
The ratio of house prices to rents reached record highs in 2006.



Note: Before 1991, the FHFA purchase-only index was spliced with the FHFA total index. Before 1983, the CPI-U owner's equivalent rent of primary residence was spliced with the PCE price index for owner-occupied dwellings.
Sources: Federal Housing Finance Authority, Department of Labor (Bureau of Labor Statistics), and Federal Reserve Board.

Excesses in the Primary Mortgage Market

Over the past decade, there has been tremendous innovation and expansion in the market in which borrowers obtained loans from mortgage originators, also known as the *primary mortgage market.* Some innovation was beneficial, increasing mortgage affordability and structuring payment terms that fit borrowers' individual circumstances. For example, the increase in *subprime lending,* defined as lending to higher-risk groups, usually at interest rates high enough to imply a large risk premium, opened up new opportunities for borrowers with weaker or limited credit histories to purchase a home. Subprime lending expands access to credit to previously underserved households—albeit at restrictive and expensive terms.

The very competitive lending environment encouraged and intensified myopia among both lenders and borrowers, both of whom took on too much risk. For example, both likely assumed that risky mortgages could be easily refinanced or that homes could be easily sold if borrowers found themselves unable to afford their mortgage payments. Underwriting standards were loosened, even for subprime borrowers, and terms became less restrictive. In some cases, down payment requirements were relaxed to the point that borrowers' mortgages were greater than the value of their

homes, as apparently both lenders and borrowers expected near-term house price appreciation. Furthermore, increasing numbers of mortgage loans were originated with limited documentation; that is, the mortgage lenders did not require borrowers to provide evidence (such as previous years' tax returns) of income or assets to affirm their ability to repay the loans.

Products appropriate for a limited group of borrowers were also offered to borrowers for whom these products were not well suited. For example, payment-option adjustable-rate mortgages ("option ARMs"), which allow monthly mortgage payments to vary so that the payment may cover only the interest owed or some of the principal owed as well, were initially targeted to borrowers with variable income, such as the self employed. Most option ARMs allowed minimum monthly payments below accrued interest so that borrowers choosing to make the minimum payment would have negative amortization, or rising loan balances. During the credit boom, option ARMs were offered to a much broader class of borrowers as a way of stretching loan affordability.

Excesses in the Market for Mortgage-Related Assets

Other developments helped set the stage for mortgage defaults. The rise of mortgage securitization, led both by government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac as well as private institutions, reduced the incentive for originators (which increasingly included non-bank mortgage specialists) to properly evaluate risk.

For many years, lenders followed an "originate-to-hold" model in which they kept the loans they originated. Securitization allowed lenders to move to an "originate-to-distribute" model by transforming collections of individual mortgages into *mortgage-backed securities* (MBS)—tradable securities backed by the loans—and selling the MBS to other investors. (Box 2-1 defines "mortgage-backed securities" and other financial terms.) Lenders that sold MBS used the cash to originate more loans and create new MBS, benefiting themselves as well as borrowers and investors. Securitization under the originate-to-distribute model seemed to work well. Borrowers benefited from lower mortgage rates, and investors benefited from being able to diversify their investments across a wider set of assets.

Lost in the frenzy of lending, borrowing, and securitization was the fact that the benefits of securitization come with a cost. In an originate-to-hold model, the loan originator will lose if the borrower defaults, and so the originator has the incentive to gather information on the borrower to be sure the borrower can afford to pay the mortgage. In contrast, in an originate-to-distribute model, the private-label MBS investor, not the originator, bears the default risk. Because originators do not expect to bear the risk, they do not have as much incentive to make sure the borrowers can pay. Moreover, the incentive for lenders to originate excessively risky loans becomes tempting. Because

Box 2-1: Definitions of Select Financial Terms

Asset-backed security (ABS): A security whose cash flows are backed by the principal and interest payments of a collection of loans, such as credit cards, automobile loans, and student loans.

Auction rate security (ARS): A long-term debt instrument whose interest rate is reset periodically (typically every 7, 28, or 35 days) through an auction process.

Collateralized mortgage obligation (CMO): A complex mortgage-backed security in which cash flows from the mortgage payments are split into tranches (slices), and each tranche is sold as a separate security.

Commercial mortgage-backed security (CMBS): A mortgage-backed security backed by mortgages on commercial property.

Commercial paper (CP): Short-term loans issued by corporations. CP terms range from 1 day ("overnight") to 270 days. Asset-backed commercial paper (ABCP) is commercial paper that is secured by assets. Commercial paper can be issued by financial institutions as well as non-financial institutions.

Government-sponsored enterprise mortgage-backed security (GSE MBS): A mortgage-backed security that includes a credit guarantee from a government-sponsored enterprise (Fannie Mae or Freddie Mac).

London interbank offered rate (LIBOR): The interest rate at which banks offer to lend unsecured funds to other banks. The 3-month LIBOR, the rate at which banks offer to lend for a 3-month term, is a key reference rate used for many financial contracts.

Mortgage-backed security (MBS): security whose cash flows are backed by the principal and interest payments of a collection of mortgage loans.

Mortgage-related asset: Any original mortgage loan or MBS.

Non-agency mortgage-backed security (non-agency MBS): A mortgage-backed security that does not include a credit guarantee from a government agency or government-sponsored enterprise. Also known as private-label MBS.

Residential mortgage-backed security (RMBS): A mortgage-backed security backed by mortgages on residential property.

Secured debt: A loan that is backed by collateral. If the borrower defaults on repayment, the lender can seize the collateral, sell it, and use the proceeds to repay the debt.

TED spread: The difference between the 3-month LIBOR and the 3-month Treasury Bill rate, a commonly used indicator of financial market distress.

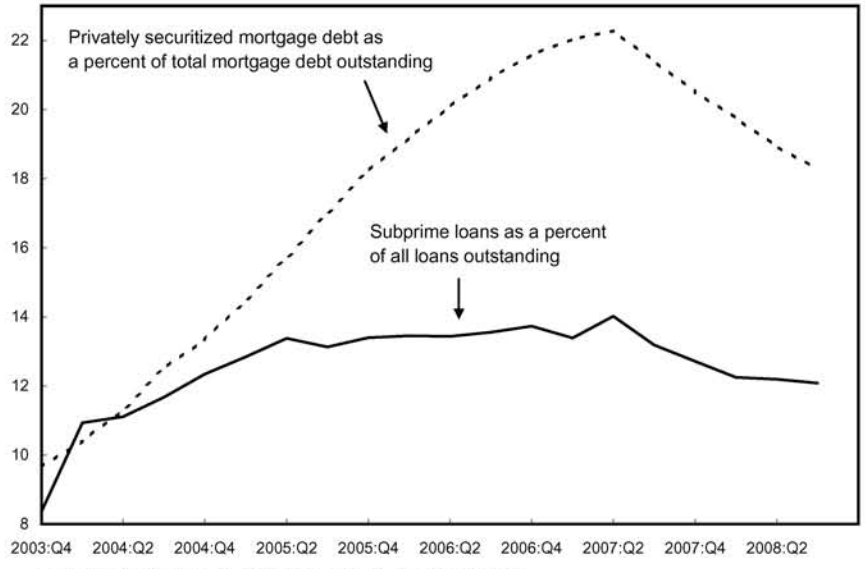
Unsecured debt: A loan that is not backed by collateral. The loan is supported only by the borrower's creditworthiness.

MBS are complex securities, many investors relied on credit rating agencies to provide them with information on default risk rather than conducting their own due diligence. For their part, credit rating agencies made initial assessments that, in hindsight, used faulty assumptions and led to a significant number of downgrades. To their detriment, many market participants relied heavily on ratings that turned out to be overly optimistic.

Chart 2-2 shows the fraction of total mortgages outstanding that are securitized by private institutions (private-label MBS) as well as the share of total mortgage originations accounted for by subprime mortgages. Data on subprime mortgages have a limited history, which is perhaps not surprising given how recently this market became important. While a number of factors led to the surge in subprime lending, the increase in privately-issued MBS, and the increase in securitization more generally, likely played an important role.

Mortgage-backed securities were often repackaged into even more complex securities, reflecting an increased demand from investors for customized investment products called structured products. A *collateralized mortgage obligation* (CMO), for example, is a mortgage-backed security in which cash flows from the mortgage payments are ordered into "tranches" (slices), and each tranche is sold as a separate security. The tranches are typically ranked in descending order of repayment from highest (super senior) to lowest (equity). Senior tranches have a priority claim on the cash flow from the underlying

Chart 2-2 **Privately Securitized Mortgages and Subprime Mortgage Loans**
Privately securitized mortgages and subprime loans have become a larger share of the market since 2003.
Percent



Sources: Mortgage Bankers Association and Federal Reserve Board.

collateral and must be paid before junior tranches. The middle tranches of a CMO could be repackaged yet again into even more complex securities.

A combination of overreliance on credit rating agencies' assessments of complex securities and flaws in the assumptions underlying those assessments, along with insufficient risk management at financial firms and regulatory policies that failed to mitigate risk-management weaknesses, created a situation in which many financial firms held mortgage-related assets that turned out to be far more risky than anticipated.

The Credit Crunch

Eventually, the number of houses on the market began rising faster than sales, and prices started to fall. Nationally, home price appreciation began to slow in 2005, and price levels began to fall in the third quarter of 2007, according to the FHFA purchase-only house price index. In some mortgage markets and in some regions, prices began their decline a year before the national average. The inventory of new homes for sale rose rapidly relative to the pace of new home sales, contributing to price declines. The residential construction industry reacted to a decline in housing demand, and by 2006, this sector experienced job losses as new housing starts plunged (Chart 2-3).

Chart 2-3 **Single-Family Housing Starts**

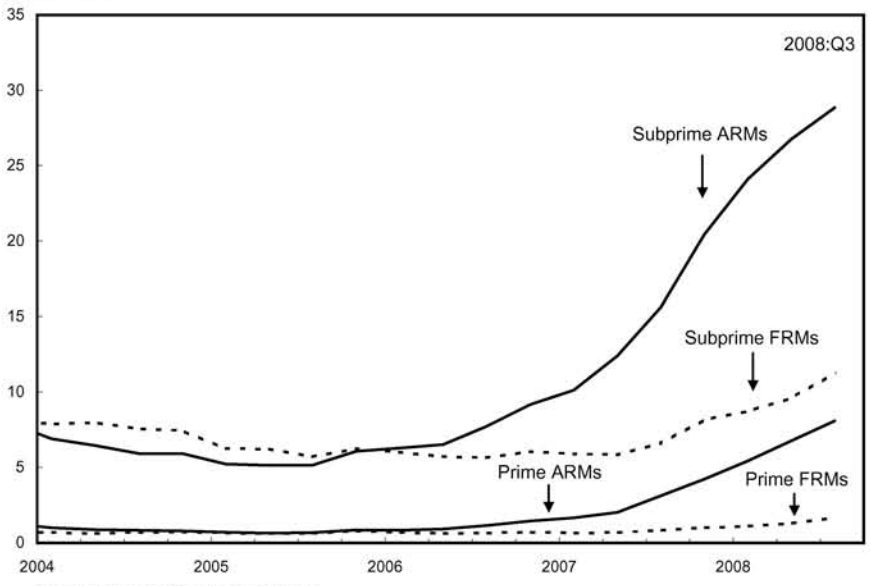
Housing starts have fallen more than 75 percent from their peak in 2006 to the lowest level on record.

Source: Department of Commerce (Bureau of the Census).

As house prices faltered, borrowers with little or no equity in their homes quickly found that they owed more to lenders than their homes were now worth in the market. Such borrowers are often referred to as being "underwater." Some borrowers were unable to afford their mortgage payments either because of financial circumstances or because their mortgage payments rose, as their mortgage contract included a sizable increase in monthly payments over the life of the loan. If these borrowers were also underwater, they were not able to refinance, making them likely to default. In fact, among subprime loans that were securitized in the second half of 2006, over 7 percent of these loans were at least 60 days past due within the first 6 months, exposing the weakening in underwriting standards over time and the effect of house prices faltering. By way of comparison, among subprime loans securitized in the first half of 2005, less than 3 percent of these loans were at least 60 days past due within the first 6 months.

Chart 2-4 shows that the rates of serious delinquency (defined as 90 days past due or in default) for both prime and subprime mortgages have risen since 2005. Rates for both fixed-rate mortgages (FRMs) and adjustable-rate mortgages (ARMs) have increased. Delinquency rates are considerably higher in the subprime market than in the prime market; however, rates of serious delinquency in both the subprime and prime mortgage markets have reached their highest levels since the Mortgage Bankers Association began collecting these data in 1979.

Chart 2-4 **Percent of Mortgages 90 Days Past Due or in the Process of Foreclosure**
Subprime adjustable-rate mortgages (ARMs) have performed particularly poorly over the past year.



Source: Mortgage Bankers Association.

Lenders and investors that held mortgages and mortgage-backed securities, particularly risky subprime mortgages, incurred losses as default rates rose. Lenders demanded higher risk premiums in the form of higher mortgage spreads (mortgage interest rates charged in excess of long-term Treasury rates), and the supply of mortgage credit—at any given spread—decreased. In fact, new subprime lending began to dry up altogether beginning in 2007. With the unexpected increase in default rates, the value of the mortgages declined, and uncertainty over the future value of the complex securities that were backed by, or derived from, these mortgages increased. Demand for mortgage-related assets plummeted, particularly for subprime mortgages held as whole loans (original mortgage loans) and non-agency mortgage-backed securities for which uncertainty was the greatest. As a result, the market price for these assets fell dramatically.

Mortgage-related assets are very widely held. Domestic and international banks hold about three-fourths of the whole loans held outside of the GSEs, and banks hold about one-half of mortgage-related securities held outside of the GSEs. Insurance companies hold some whole loans and hold almost one-fourth of mortgage-related securities. Pensions and hedge funds also have substantial positions in mortgage-related securities. As of the end of 2008, global financial institutions that invested in these assets reported over $1 trillion in losses.

Leverage and Reliance on Short-Term Funds

The declining value of mortgages and mortgage-backed securities threatened the ability of systemically important financial institutions to meet their financial obligations (that is, their "solvency") because portions of the financial system are highly exposed to shocks. That exposure takes two basic forms: high *leverage* and reliance on *short-term funding.* Leverage is the use of borrowed funds (debt), as opposed to investment capital (equity), to finance assets. Short-term funding is the use of debt financing that must be paid back within a short period of time.

Before the financial crisis, the major investment banks were levered roughly 25 to 1. This means that every $100 in assets was funded by $96 in debt, leaving only $4 in equity. In other words, investment banks owned complex investment portfolios with only 4 percent down. Such leverage was a fundamental source of fragility—the capital base of those institutions would be eliminated by just a 4 percent decline in asset values. (Commercial banks, in contrast, were levered about 12 to 1.)

In addition, many major financial firms rely on short-term funding, requiring them to continually replace existing debt with new debt (a process called "rolling over" debt) and thereby putting them at the mercy of changes in the availability of liquidity. Put another way, if a bank is levered using

long-term debt, it can survive as long as it can make debt service payments; if a bank is levered using short-term debt, it has to pay off the entire debt every few weeks, which it typically does by taking out new short-term debt. During the credit boom, liquidity was easily available, and firms could roll over enough debt to satisfy their short-term funding needs. Firms began to rely even more heavily on short-term debt and created financial innovations, such as auction rate securities (ARS) and structured investment vehicles (SIVs), to address those demands. But, when doubts arose about the availability of liquidity, those financing methods broke down, and firms faced a considerable risk of not being able to roll over their financing.

The collapse of Bear Stearns in March 2008 provides an example of how high leverage, combined with a heavy reliance on short-term term funding, can make a financial institution more fragile than it ought to be. In 2007, Bear Stearns was one of the largest global investment banks. Bear Stearns's assets were highly concentrated in mortgage-backed securities. In fact, two of Bear Stearns's managed hedge funds collapsed in June 2007 because of subprime mortgage losses.

During the week of March 10, 2008, rumors spread about liquidity problems at Bear Stearns, resulting in a "run." As the rumors spread, Bear Stearns was unable to borrow funds from other financial institutions, despite the fact that Bear Stearns pledged high-quality financial assets as collateral to secure repayment of many of its short-term loans. In a secured funding arrangement, the borrower agrees to forfeit the collateral if it defaults on the loan. However, possibly because the legal process of transferring ownership of collateral is quite lengthy, many of Bear Stearns's secured lenders refused to continue ("roll over") their short-term lending arrangements. As a result, Bear Stearns could not meet its short-term funding needs.

On Friday, March 14, 2008, the Federal Reserve Bank of New York (FRBNY) provided emergency funding to Bear Stearns. However, the FRBNY funding could not stop Bear Stearns's downward spiral, and Bear Stearns concluded that it would need to file for bankruptcy protection, unless another firm purchased it. On Sunday, March 16, 2008, Bear Stearns announced that it would be acquired by JP Morgan Chase, with financing support from the FRBNY.

Macroeconomic Consequences of the Crisis

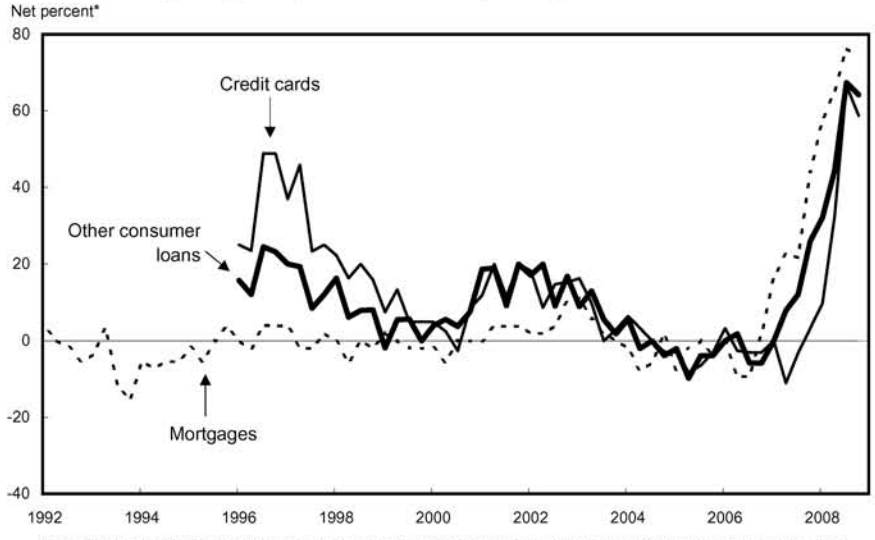
The effects of the crises in the housing and financial markets were most visible for Wall Street firms like Bear Stearns, but their impact has been felt by businesses, consumers, and governments throughout the world. The

precipitous drop in the stock market has drastically eroded the value of Americans' stock portfolios, 401(k) accounts, and other retirement accounts. The tightening of credit has made it more expensive and difficult for many families to borrow money for cars, homes, and college tuition. Many healthy businesses have found it harder to get loans to expand their operations and to create jobs.

Banks Reduced Lending to Consumers and Businesses

As default rates for household debt rose, lenders became increasingly reluctant to make any but the least risky loans. Many banks and other creditors tightened standards on mortgages and consumer debt. The Federal Reserve's Senior Loan Officer Survey on Bank Lending Practices reports changes in the supply of bank loans to businesses and households. As Chart 2-5 shows, the net percent of domestic lending institutions reporting that they tightened lending standards began rising at the end of 2007. Tighter standards reduce the availability of credit for households and, as a result, hinder households' ability to maintain spending in difficult economic times.

Chart 2-5 **Domestic Banks Tightening Lending Standards**
Banks have been tightening lending standards on a variety of loan products since the end of 2007.



Note: "Net percent" refers to the percent of respondents tightening less the percent of respondents loosening. The values for mortgages for the second quarter of 2007 through the fourth quarter of 2008 were calculated as a weighted average of prime, subprime, and nontraditional loans using weights estimated by the Council of Economic Advisers.
Source: Federal Reserve Board.

Similar survey responses on banks' standards for commercial and industrial loans show that banks tightened lending standards for business loans starting in mid-2007. The weakness in the business sector seen in business investment and outlays reflects, in part, this reduced access to credit from banks and other lenders, forcing businesses to tap cash reserves to fund investment and expenditures.

The Onset of the Crisis

Within a 9-day period in September 2008, the crisis deepened abruptly with a series of stunning events. On Sunday, September 7, 2008, the Federal Housing Finance Authority (FHFA) placed the ailing mortgage giants Fannie Mae and Freddie Mac into conservatorship because the FHFA determined that the values of Fannie Mae's and Freddie Mac's mortgage-related assets had deteriorated to the point that these institutions could no longer operate safely and soundly. Conservatorship gave the FHFA powers typically associated with Fannie Mae's and Freddie Mac's directors, officers, and shareholders, including all actions necessary and appropriate to put each company in a sound and solvent condition, carry on each company's business, and conserve the property and assets of each company. In addition to the FHFA conservatorship, the Treasury Department entered into commitments to inject up to $100 billion in capital into each firm in exchange for preferred stock and warrants (options to buy equity shares at a predetermined price) for common stock, created a temporary lending facility to provide secured funding for Fannie Mae and Freddie Mac in exchange for government-sponsored enterprise mortgage-backed security (GSE MBS) collateral, and initiated a program to purchase GSE MBS in the open market.

One week later, on Sunday, September 14, 2008, the investment bank Lehman Brothers filed for bankruptcy, and another investment bank, Merrill Lynch, negotiated an acquisition by Bank of America. Both investment banks suffered billions of dollars of writedowns (losses from declines in value) of mortgage-related assets.

Two days later, on Tuesday, September 16, 2008, the Federal Reserve announced the creation of a credit facility (lending arrangement) in exchange for a majority equity stake in the insurance giant American International Group (AIG). AIG suffered billions of dollars of losses from entering into *credit default swap* (CDS) contracts to insure against losses on complex MBS.

A credit default swap is a type of *derivative* contract that has become very popular in recent years. The value of a CDS contract is "derived from" an underlying credit instrument, such as a bond or an MBS, where one party—say a borrower—owes money to another party. The buyer of a CDS contract agrees to make a series of payments (similar to an insurance premium) to

the seller over time. If the borrower who owes money according to the underlying credit instrument defaults, the seller of the CDS agrees to make a pre-specified payoff to the buyer. Essentially, the buyer of the CDS has taken out insurance on the default risk of a credit instrument, and the seller of the CDS is the insurance provider.

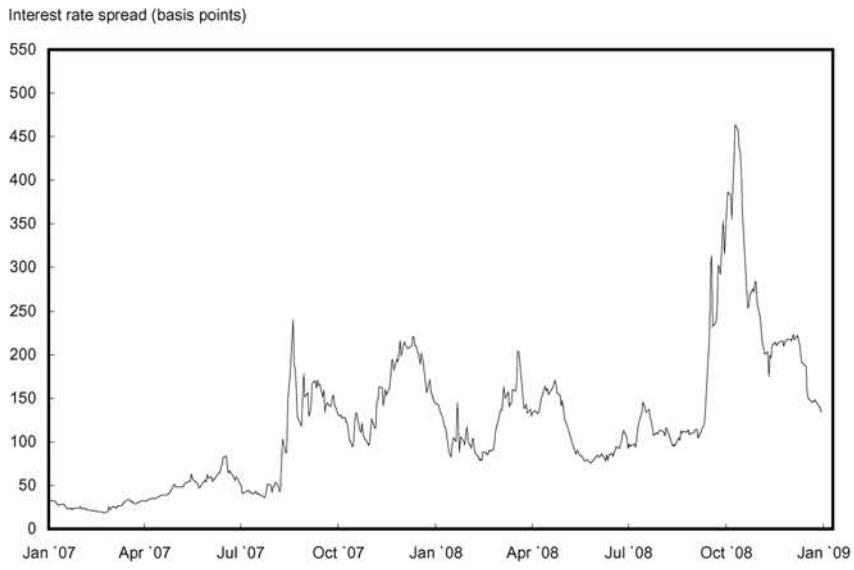
In the case of AIG, most of its CDS counterparties were banks that bought CDS contracts because they wanted to hedge against declines in the MBS held on their balance sheets. Contractual features in AIG's CDS required AIG to post cash collateral to their counterparties as the values of the MBS declined. The collateral calls were so large that AIG did not have the cash to post, and AIG faced a liquidity crisis. The increased burden to honor CDS contracts also undermined AIG's solvency.

Credit Market Investors Reduced Lending to Businesses

Following these events, reassessments of risk led to a flight to quality. This flight to quality extended beyond mortgage-related assets and affected a number of non-bank institutions and assets that businesses use to pledge as collateral for secured funding. For long-term debt funding (and equity funding), businesses rely on *capital markets,* where mutual funds, hedge funds, and pension funds, for example, invest in long-term bonds issued by corporations and State and local governments. For short-term funding, businesses rely on the *money market.* An important source of lending in the short-term credit markets are *money market mutual funds* (or money funds), which often invest in instruments called "paper." *Commercial paper* (CP) is short-term funding used by corporations, and it is often issued as asset-backed commercial paper (ABCP), which is secured by collateral. Other money market instruments include Treasury bills and *repurchase agreements* (or repos), where a borrower agrees to sell securities to a lender for cash and simultaneously agrees to buy back those securities at a later date at a higher price. A repo is economically similar to a secured loan, with the buyer/lender receiving securities as collateral to protect against default.

As lenders sacrificed yield for the safety of Treasury securities, interbank lending rates rose to unprecedented levels. Financial institutions pulled back from extending credit to each other, except at the very shortest maturities, because of an aversion to counterparty risk or concerns about their own liquidity needs. As shown in Chart 2-6, the *TED spread* increased dramatically in September 2008 above already elevated levels. The TED spread is the difference between the 3-month *London Interbank Offered Rate* (LIBOR) and the 3-month Treasury Bill rate. LIBOR is the rate at which banks offer unsecured loans to other banks. The dramatic increase in the TED spread indicates considerable distress in interbank lending.

Chart 2-6 **The TED Spread**
The spread between the 3-month London Interbank Offered Rate (LIBOR) and yields on 3-month Treasury bills grew to historic highs during 2008, indicating distress in interbank lending.



Sources: British Bankers Association and the Treasury Department.

When large financial institutions faced perceptions of insolvency, creditors became less willing to lend to them, even in the very short term. Companies that relied on what had been perceived as low-risk secured funding, such as ABCP and repos, were also affected by the freeze in lending. Left unchecked, the progression would have led to "runs." Institutions that were not able to obtain funding due to perceptions of insolvency would have faced a liquidity crisis. Without the ability to roll over their short-term debt, institutions that relied heavily on short-term financing would have to sell their assets at "fire sale" prices to meet their financial obligations. Such actions can lead to an actual (rather than perceived) insolvency crisis, which would likely have led to widespread financial and economic failure.

Money funds themselves can face a run if investors lose confidence in the fund's ability to protect them from a loss of principal. Principal protection is most visible in the fact that money funds seek to maintain a stable $1.00 net asset value (NAV). While money funds are required by law to invest in short-term low-risk securities, investment losses are possible. In September 2008, money market funds that had invested in Lehman Brothers commercial paper faced losses when Lehman Brothers declared bankruptcy. Over time, investment gains in other securities held in the diversified portfolios of

money funds are usually big enough to offset the rare loss in an individual security. However, if an increase in investor anxiety causes a run in the form of large-scale redemptions, the money fund may be forced to liquidate other assets at below-market prices. If that happens, the fund may be unable to support a $1.00 NAV and thus "break the buck."

The Effect of the Crisis on the Non-Financial Economy

The financial crisis spread beyond financial institutions. It also affected households and non-financial businesses in the non-financial ("real") economy.

The Effect of the Crisis on Households

The financial crisis has affected households through a number of channels, including a sharp loss in stock market wealth (as discussed in Chapter 1), a further tightening in household credit markets, prospects for a slower recovery in the housing market, and increased pessimism regarding current and future economic conditions.

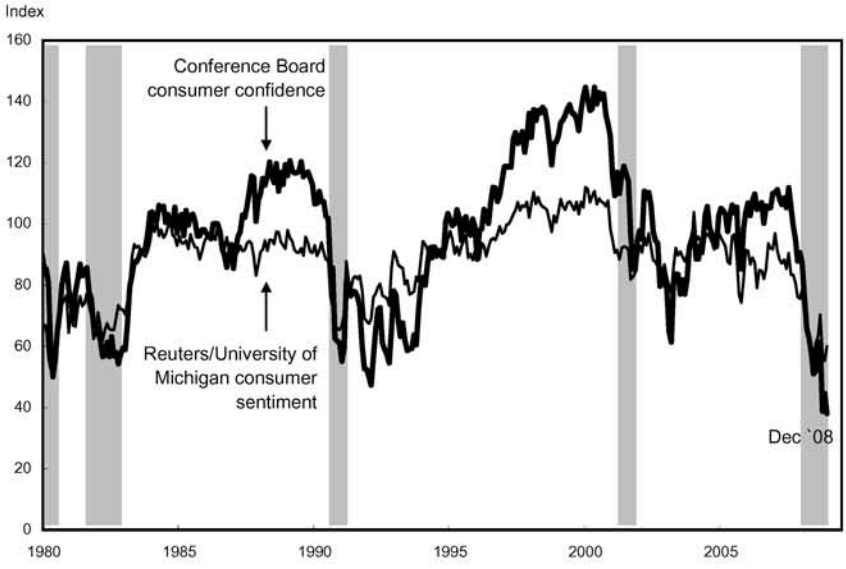
In the wake of the financial crisis, banks also began to further restrict households' access to credit. As mentioned earlier and shown in Chart 2-5, banks began tightening standards on household loans by the end of 2007. As the financial crisis deepened in September 2008, credit became even more expensive and less available. For example, interest rates on 30-year fixed-rate mortgages rose 0.7 percentage point by the end of October 2008 from their September weekly low of 5.8 percent. Continued tightness in mortgage credit markets could reduce demand for housing and could slow the recovery in this market.

Chart 2-7 shows measures of consumer confidence from both the Reuters/University of Michigan survey and the Conference Board survey, which reveal substantial pessimism among consumers in the recent data. In fact, in October 2008 the Conference Board measure of confidence reached the lowest level ever seen in the index's 51-year history.

The Effect of the Crisis on Businesses

The financial crisis has also affected non-financial businesses through a number of channels, including a tightening in business credit markets and weaker demand both domestically and abroad. As mentioned above, businesses on the whole have had a difficult time raising funds in private debt and equity markets because of more expensive financing terms and reduced access. As a result, businesses' ability to finance ongoing operations, to invest, and to increase hiring has been curtailed, particularly beginning in the fall of 2008.

Chart 2-7 **Consumer Confidence**
Consumer confidence has declined sharply since the start of credit market disruptions in August 2007.



Note: Grey shading indicates recession.
Sources: Reuters/University of Michigan and Conference Board.

However, businesses have also reduced their demand for funds to expand operations. As consumer demand has weakened, businesses have become less willing to make investments to expand production. In addition, the crisis in credit markets has made it more difficult for consumers to finance some purchases, especially of "big ticket" durable goods such as automobiles. These difficulties result from disruptions in the market for asset-backed securities (ABS). Like mortgage-backed securities, asset-backed securities are tradable financial instruments that are backed by pools of individual loans—in this case, consumer loans. Since the financial crisis deepened in the fall of 2008, the demand for ABS has notably declined. These consumer credit market disruptions have led to a decline in consumer purchasing that has further reduced business demand for credit.

Businesses also have faced weaker demand abroad as the financial crisis has worsened the outlook for global economic growth. As a result of all these factors, business confidence has fallen notably since the fall of 2008.

Policy Responses to the Crisis

The global financial crisis is massive in scale and far-reaching in scope. The complexity of the financial system, as well as the financial instruments that are traded in various markets, has meant that the Government has had to take many new and drastic actions very quickly to limit further turmoil. While many different responses have been undertaken by different Government agencies, all of the responses have been designed to achieve the overarching goals of preserving the stability of financial institutions and boosting liquidity in financial markets.

Policy Responses in 2007

After the disruption in credit markets in the summer of 2007, the Administration and the Federal Reserve responded through a series of coordinated actions aimed at providing liquidity to financial markets and stabilizing housing markets. In the second half of 2007, for example, the Federal Reserve lowered interest rates and injected liquidity into financial markets by taking the following steps:

- Lowering the target for the Federal Funds rate (the interest rate at which U.S. banks lend to other banks overnight) by a total of 1 percentage point between September 2007 and December 2007 to reduce banks' funding costs.
- Expanding the Federal Reserve's lending through the discount window (the lending facility of last resort for depository institutions such as banks) to provide term financing for periods as long as 90 days, and establishing a Term Auction Facility (TAF) to further increase the availability of liquidity for depository institutions. Longer financing terms allow borrowers to roll over debt less frequently.
- Establishing reciprocal currency arrangements ("swap lines") with the European Central Bank (ECB) and the Swiss National Bank (SNB) to facilitate those banks' provision of dollar liquidity to institutions in their jurisdictions.

The Administration also took several steps to address difficulties in the housing market:

- In August 2007, the Administration launched a new program at the Federal Housing Administration (FHA) called *FHASecure.* The FHA insures (but does not originate) mortgages for qualified low- and moderate-income borrowers who have less-than-perfect credit and little savings for a down payment. The *FHASecure* initiative offers homeowners who have adjustable-rate mortgages, current or delinquent, the ability to refinance into a fixed-rate FHA-insured mortgage.

- In August 2007, the Administration repeated its call for Congress to pass a reform package for the GSEs Fannie Mae and Freddie Mac. Congress ultimately passed the Housing and Economic Recovery Act of 2008 (HERA) in July 2008 to strengthen the regulator charged with overseeing the GSEs.
- In October 2007, HOPE NOW, a private sector alliance of mortgage industry participants, was launched to encourage servicers, housing counselors, and investors to work together to help streamline the process of modifying mortgages for borrowers with adjustable-rate mortgages who can afford their current mortgage payments but will have trouble when their interest rates rise.

Policy Responses in 2008

As the crisis worsened over the course of 2008, the Administration and the Federal Reserve took additional and extraordinary steps to prevent systemwide failures in financial markets, provide protections for households' savings, and encourage the renegotiations of mortgages to prevent unnecessary foreclosures.

Intervention in Troubled Institutions

The Government has focused on preserving the stability of the overall financial system and acted to prevent disorderly failures of several large, interconnected firms—and did so in a way that protects taxpayers. For example, the failure of Fannie Mae and Freddie Mac would have materially exacerbated financial market turmoil and added to the disruptions in the mortgage market, putting more downward pressure on house prices. Examples of interventions in other troubled institutions are discussed above.

Injecting Liquidity

The Government has taken unprecedented action to inject liquidity—the grease that keeps the gears of the financial system turning. The Federal Deposit Insurance Corporation (FDIC) has temporarily guaranteed most new unsecured debt issued by insured banks; that is, the FDIC has agreed to make scheduled principal and interest payments in the event the issuer fails to make those payments. As a result, banks have found it easier to borrow.

The Federal Reserve has used a variety of tools to inject hundreds of billions of dollars in new liquidity into the financial system. The Federal Reserve has expanded the availability of term financing provided to depository institutions through the discount window and the Term Auction Facility (TAF). To support the liquidity of primary dealers, the Federal Reserve expanded its securities lending program by broadening the securities that can be used as collateral as well as extending the terms of the loans. More information

on the securities lending program is on the Federal Reserve Bank of New York's website. In addition, the Federal Reserve established a Primary Dealer Credit Facility (PDCF) to meet the short-term funding needs of primary dealers, which are banks and securities broker-dealers that are authorized to trade directly with the Federal Reserve. Over the course of 2008, the Federal Reserve further reduced the target for the Federal Funds rate by over 4 percentage points. Moreover, it expanded its swap lines with foreign central banks and established a number of special programs designed to address strains in financial markets, including facilities structured to provide support to money market mutual funds, the commercial paper market, and the asset-backed securities markets.

Protecting Consumers, Businesses, and Investors

The Government has provided substantial new protections for consumers, businesses, and investors. The FDIC has temporarily expanded the amount of money insured in bank and thrift checking accounts, savings accounts, and certificates of deposit from $100,000 to $250,000 per depositor. The FDIC has also temporarily removed insurance limits for non-interest-bearing transaction accounts, which are used by many small businesses to finance daily operations. The Treasury has offered temporary government insurance for money market mutual funds. The Securities and Exchange Commission is vigorously investigating fraud, manipulation, and abuse in the securities markets, with an emphasis on abusive practices involving "short sales" (see Box 2-2). The programs being undertaken by Federal agencies are aimed at providing greater stability for the financial system.

Box 2-2: Short Sales

A short sale involves the sale of a stock by an investor who does not own it. To deliver the stock to the purchaser, the short seller must borrow the stock from a broker or from another investor. Later, the short seller closes out the position by purchasing the stock on the open market. Short sales are profitable if the stock price declines, because the short seller can buy the stock at the lower price. But if the price rises, the short seller will need to buy the stock at a higher price and, therefore, incur a loss.

Short sales are a part of many useful investment and trading strategies. Short sales are valuable to an investor who believes that the stock price will fall because the stock is overvalued. In this case, the short sale is used in the same way that an investor who believes that a security is currently undervalued will buy the stock. Short sales can be used

continued on the next page

Box 2-2 — continued

by market-makers in response to buyer demand for a stock that they do not currently own. Market-makers provide liquidity to other market participants by quoting buying prices (bids) and selling prices (asks) on stocks. They hope to profit on the difference, or spread, between the bid and ask prices, rather than on any price movement. Thus, short sales provide the market with an important benefit—liquidity. Short sales also provide the market with a second benefit—pricing efficiency—because efficient markets are characterized by prices that fully reflect both buying and selling interests.

Although short selling serves useful market purposes, in some rare instances it may be used to illegally manipulate stock prices (just as stock purchases may, in rare instances, be used to manipulate stock prices). One example is the "bear raid" in which a trader engages in heavy short selling in an attempt to drive down prices in the hope of triggering a cascade of sell orders from others that depresses prices further. The Securities and Exchange Commission (SEC), the primary overseer of U.S. securities markets, has promulgated many rules to prevent stock price manipulation and has aggressively pursued abusive short-selling practices that involve insider trading and other federal securities law violations.

At the same time, the SEC has adopted a balanced approach in pursuit of its mission to protect investors; maintain fair, orderly, and efficient markets; and facilitate capital formation. For example, the SEC has suspended short sale price restriction rules (for example, the uptick rule, which requires that a short sale must occur at a price above the most recent different transaction price) after carefully considering the solid empirical evidence based on research conducted by the SEC and independent academic economists that shows that the purported benefits of the rules no longer justify the costs. Also, the SEC has enacted rules that govern short sales immediately before stock offerings in an effort to maintain the integrity of the capital-raising process.

Stabilizing the Housing Market

The Administration continued its efforts to mitigate effects of the declining housing market and to help responsible homeowners in danger of defaulting on their mortgages. The FHA has provided countercyclical support for the mortgage market as conventional financing has partly withdrawn from the market. Between the time *FHASecure* was launched in August 2007 and December 2008, FHA helped more than 450,000 families, many of whom were facing the loss of their homes, refinance into a more affordable FHA-insured mortgage. In the midst of all of this, the FHA has been a leader

in contacting FHA-insured homeowners in trouble to work out solutions. In 2008, FHA servicers completed more than 100,000 loss-mitigation actions. The Department of Housing and Urban Development (HUD) also launched the Neighborhood Stabilization Program in September 2008, which provides emergency assistance to State and local governments to acquire and redevelop foreclosed properties that might otherwise be abandoned and become blight.

In September 2008, the Treasury began purchasing GSE MBS and related products to support the mortgage financing market, as authorized by the Housing and Economic Recovery Act of 2008 (HERA). More recently, the Federal Reserve announced its intentions to purchase large volumes of agency debt and MBS backed by Fannie Mae, Freddie Mac, and Ginnie Mae (a government-owned corporation within HUD) in an effort to lower mortgage rates and increase the availability of mortgage credit.

In October 2008, additional mortgage assistance for homeowners at risk of foreclosure was introduced. The HOPE for Homeowners program, also authorized by HERA, refinances mortgages for borrowers who are having difficulty making their payments but can afford a new fixed-rate mortgage insured by the FHA. That refinancing is available, however, only if lenders are willing to write down the existing mortgage to below the new appraised value of the home, creating home equity for a borrower who may have been underwater. Some lenders may be willing to do so in order to avoid foreclosures that might be even costlier. In return, the borrower agrees to share the equity created at the beginning of this new mortgage and any future appreciation in the value of the home if the home is sold or refinanced. Unfortunately, some limitations of the program that were written into the law have limited the program's flexibility and made it less attractive to participants than it otherwise might be.

The HOPE NOW Alliance launched a new program in November 2008 that will make it easier and faster for the most at-risk homeowners to modify their mortgages and stay in their homes. The Streamlined Modification Plan expands upon the existing efforts of many lenders. Under the plan, lenders use an expedited process to modify, or restructure, a mortgage so that the homeowner can afford the monthly payments. The streamlined process will apply to at-risk borrowers who are at least 90 days late on their existing mortgages and whose loans are owned by a lender or servicer in the HOPE NOW alliance or are owned by Freddie Mac or Fannie Mae. The Streamlined Modification Plan also applies to all mortgage types.

In November 2008, HUD published a final rule reforming the regulations for the Real Estate Settlement Procedures Act (RESPA) to simplify the mortgage settlement process and improve consumers' ability to knowledgeably shop for mortgage loans. Included in the RESPA reform, which will become fully effective in January 2010, is a new uniform Good Faith Estimate (GFE) form that will inform borrowers of the charges they should expect at loan

settlement and identify key features of the loan being offered, including whether the interest rate, monthly amount owed, and loan balance can rise, and if so, by how much. These disclosures will inform borrowers about potentially risky features of loan offers and vastly improve consumers' ability to compare loan offers, which should lead to improved loan terms and lower origination fees.

International Cooperation

The United States has also been at the forefront of a number of international reform efforts. U.S. Government officials have played leading roles in advancing reform measures that are being undertaken at the Financial Stability Forum, the Basel Committee on Banking Supervision, the Committee on Payment and Settlement Systems, and the International Organization of Securities Commissions. Since the onset of the global crisis, the Administration and the Federal Reserve have been cooperating even more closely with overseas partners. For example, in October 2008, the Federal Reserve and other central banks around the world enacted a remarkable coordinated cut in interest rates, which will help ease the pressure on credit markets around the world. In addition, starting at the end of 2007, the United States bolstered U.S. dollar liquidity in European financial markets by setting up dollar *swap facilities* (or *swap lines*) with European central banks, including the Bank of England, the European Central Bank, and the Swiss National Bank, among others. A dollar swap facility allows a foreign central bank to swap its currency for U.S. dollars from the Federal Reserve at a predetermined exchange rate. European central banks use swap lines to provide dollars to European commercial banks to help them meet their dollar-denominated funding needs during a period when investors are unwilling to be counterparties to dollar-denominated liabilities. European central banks swapped local currency for dollars with the Federal Reserve in order to limit disruptions to financial and currency markets. Starting in October 2008, the Federal Reserve removed the limits on swap lines for a number of foreign central banks and provided limited swap lines to other countries, including new $30 billion swap facilities for Brazil, Mexico, Singapore, and South Korea.

On November 15, 2008, the United States hosted the first of what is expected to be a series of summits of leaders of major developed and developing countries to move forward in addressing the financial crisis in its international dimensions. These efforts build on the ongoing international efforts to better coordinate financial disclosure and regulation standards. To this end, the United States has participated fully in the efforts of a special working group of the Financial Stability Forum (FSF) formed in 2007. (For an explanation of the FSF, see "Looking Forward" below.)

Recapitalizing the Financial Sector

The Government has undertaken a historic effort to address the underlying problem behind the freeze in the credit markets. In October 2008, Congress passed bipartisan legislation, the Emergency Economic Stabilization Act of 2008 (EESA), authorizing the Treasury Department to use up to $700 billion in a Troubled Asset Relief Program (TARP) to stabilize financial markets. Under its authority, the Treasury Department announced that it would purchase up to $250 billion in non-voting preferred stock (a stock that represents ownership in a corporation with a higher claim on assets and earnings than common stock) in Federally regulated banks and thrifts in a Capital Purchase Program (CPP). In addition to stock, the Treasury would also receive warrants (options to buy additional shares of stock at a predetermined price) from the participating institutions. By the end of December 2008, Treasury had invested $177.5 billion in 215 U.S. financial institutions through the CPP. The new capital will help banks fill the gaps created by losses during the financial crisis, so that the banks can resume lending to businesses and consumers. In addition to banks, the Treasury has purchased preferred stock in systemically important non-bank financial institutions, which have also experienced large losses. For example, $40 billion of the $700 billion TARP fund has been used to purchase preferred shares in insurance giant AIG.

Results So Far

Although it is much too soon to be able to conduct a complete evaluation of the results of government responses to the global financial crisis, some signs of improvement in financial conditions are already emerging. The first, and perhaps most important, sign is that the financial system is noticeably more stable than just a few months ago. Ongoing capital injections under the TARP are providing necessary capital as banks begin to decrease their reliance on financial leverage, a process called "deleveraging."

TARP-provided capital is also addressing concerns about the potential insolvency of systemically important financial institutions. Government guarantee programs are providing confidence in money funds and FDIC-insured deposit accounts. As a result, the uncertainty that led to runs has abated and financial institutions now can rely on a more secure deposit base.

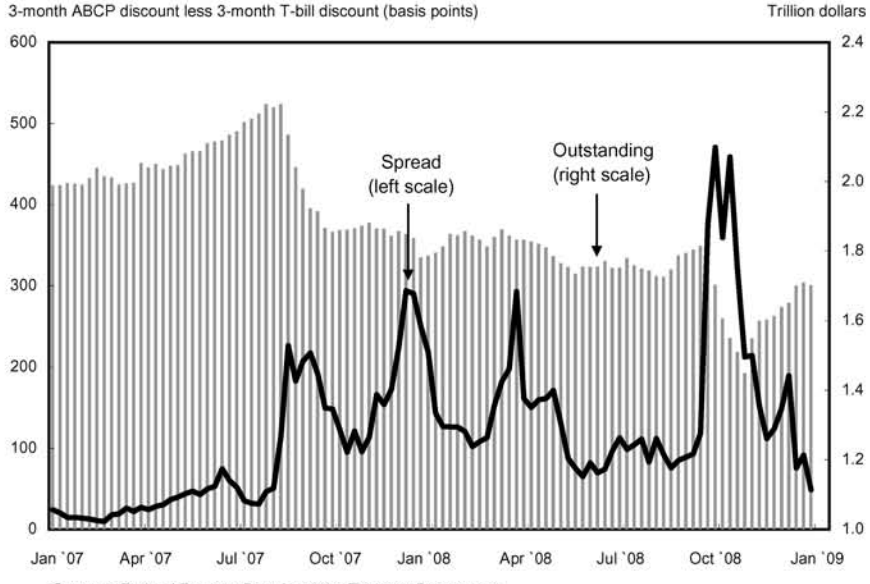
The increased confidence in a more stable financial system has laid the foundation for credit market improvements. Although conditions are still strained, banks are beginning to lend to each other again. Interbank lending rates, while still elevated, have fallen dramatically since mid-October

(see Chart 2-6). Credit spreads on bank debt are declining from their recent peaks. Federal Reserve credit facilities are providing the necessary liquidity for money funds to invest in commercial paper. Chart 2-8 shows that commercial paper spreads have been decreasing and that volumes are beginning to recover. These trends suggest that firms relying on access to short-term funding are able to borrow at reasonable rates again.

As shown in Chart 2-9, mortgage rates have also declined from their recent peaks. Rates on *conforming mortgages,* which are mortgages that conform to loan purchasing guidelines set by Fannie Mae and Freddie Mac, have benefited the most from recent actions such as the Federal Reserve's announced intentions to purchase large volumes of agency debt and MBS backed by agencies. Rates on non-conforming mortgages, such as "jumbos" (mortgages that exceed the conforming loan limits), have also benefited. However, rates still appear high relative to long-term Treasury rates, suggesting that investors continue to attach a substantial risk premium to risky assets, such as mortgage-related assets.

Improvements in long-term capital markets have been slower. The stock market is still volatile. However, highly rated corporate and municipal bond issuers have been able to issue bonds at slightly lower interest rates than before the crisis came to a head in the summer of 2008.

Chart 2-8 **Commercial Paper**
Oustanding commercial paper fell dramatically as asset-backed commercial paper (ABCP) spreads spiked in the summer of 2007 and the early fall of 2008 before recovering in late fall.



Sources: Federal Reserve Board and the Treasury Department.

Chart 2-9 **Conforming and Jumbo Mortgage Rates**
Interest rates on jumbo and conforming 30-year fixed-rate mortgages fell at the end of 2008.

Source: Bankrate.com.

Looking Forward

The current global financial crisis will create challenges for some time to come. These challenges include developing a new regulatory structure for financial markets, carefully unwinding programs put in place to stem the crisis, and developing a sustainable framework for mortgage financing.

Developing a New Regulatory Structure for Financial Markets

The current financial system has outgrown its supervisory and regulatory structures, which were designed decades ago. The new structure requires balancing the need to encourage vital innovation with the need to deter excessive risk taking. The new structure also requires the flexibility to adapt to market innovations.

The Treasury Blueprint for a Modernized Financial Structure

In March 2007, the Treasury convened a panel to discuss the competitiveness of U.S. capital markets. Industry leaders and policymakers alike agreed that the competitiveness of our financial services sector is constrained by an outdated financial regulatory framework. The panel released its blueprint

in March 2008, which presents a series of recommendations for reforming the U.S. regulatory structure. These recommendations include merging of some of the regulatory agencies that oversee banks with some of the agencies that oversee other financial institutions, taking into account the blurring distinctions between types of financial products; creating an optional Federal charter for insurance to encourage a more competitive U.S. insurance industry; and creating an objectives-based regulatory approach. More information on these recommendations is on the Treasury's website.

PWG Initiatives to Strengthen Oversight and the Infrastructure of the OTC Derivatives Market

The President's Working Group on Financial Markets (PWG), which consists of the Secretary of the Treasury, the Chair of the Board of Governors of the Federal Reserve System, the Chair of the Securities and Exchange Commission, and the Chair of the Commodity Futures Trading Commission, announced a series of initiatives to strengthen oversight and the infrastructure of the *over-the-counter* derivatives market. Many derivatives are traded over the counter (OTC), which means that they are privately negotiated and traded between counterparties, without going through an organized exchange or intermediary. One type of derivative contract that has become very popular in recent years is the *credit default swap* (CDS). (See the section "The Onset of the Crisis" earlier in this chapter for an explanation of CDS contracts.) While appropriate use of CDS contracts can help market participants manage some risks, these contracts bring with them exposure to additional firms and additional risks.

On November 14, 2008, the PWG established four specific policy objectives for the OTC derivatives market, with a primary focus on credit default swaps. The first objective is to improve market transparency and integrity for CDS so regulators and investors can access information that could help them effectively monitor the CDS market and make efficient investment decisions. The second objective is to enhance risk management of OTC derivatives by encouraging market participants to adopt standard best practices, including public reporting, liquidity management, senior management oversight, and counterparty credit risk management. The third objective is to strengthen the derivatives market infrastructure. For example, the PWG is supporting industry efforts to establish a central counterparty clearing facility for derivatives that would help to reduce systemic risk and make clear how a major participant's failure would be addressed. The fourth objective is to continue cooperation among regulatory authorities by expanding existing frameworks for cooperation, coordination, and information sharing among U.S. regulatory agencies, as well as international jurisdictions with significant OTC derivatives activity.

Developing Common International Principles

Leaders from the United States and other major nations are holding a series of summits to discuss efforts to strengthen economic growth, respond to the financial crisis, and lay the foundation for reform to help ensure that a similar crisis does not happen again. The initial "Summit on Financial Markets and the World Economy" took place on November 15, 2008, in Washington, D.C., and the leaders from the participating countries agreed on common principles for reforming financial markets and keeping international markets open to trade and investment. The leaders agreed to implement financial market reforms that include addressing weaknesses in accounting and disclosure standards for "off-balance-sheet vehicles" (explained in the next section); ensuring that credit rating agencies avoid conflicts of interest, provide greater disclosure to investors, and differentiate ratings for complex products; ensuring that firms maintain adequate capital; developing enhanced guidance to strengthen banks' risk-management practices; establishing processes whereby national supervisors that oversee globally active financial institutions meet and share information; and expanding the Financial Stability Forum (FSF) to include a broader membership of emerging economies.

The Financial Stability Forum is an organization whose members are senior representatives from national financial authorities (Australia, Canada, France, Germany, Hong Kong, Italy, Japan, the Netherlands, Singapore, Switzerland, the United Kingdom, and the United States), international groups (for example, the International Monetary Fund and the World Bank), and central bank committees. The FSF's stated mandate is to assess vulnerabilities affecting the international financial system, to identify and oversee action needed to address these, and to improve coordination and information exchange among the various authorities responsible for financial stability. Leaders at the November 15, 2008, financial summit called upon the FSF to take an active role in drawing lessons from the current crisis, improving transparency in accounting standards, and strengthening prudential regulatory standards.

Unwinding Temporary Programs

The Government's efforts to restore stability and provide liquidity to the financial system introduced many programs whose continued existence the Government must evaluate as the crisis abates. Some programs should be phased out according to a preannounced schedule, while others should be phased out naturally as the costs of participation come to outweigh the benefits.

One program that is set to end in less than 1 year is the Treasury temporary guarantee program for money market funds that were deposited before September 19, 2008. This program was set up with an initial term of several months, after which the Secretary of the Treasury would review the need and terms for the program and the costs to provide the coverage. If the program is extended, funds will have the opportunity to renew their purchase of ongoing coverage. The Secretary has the option to extend the program until September 2009 at the latest.

Two programs that will likely be phased out over the next 5 years are the Federal Reserve's new credit facilities and the Treasury's Capital Purchase Program (CPP). Aside from the Federal Reserve's term auction facility, the new credit facilities' preannounced termination dates are all within the next 2 years, unless the Federal Reserve determines that conditions warrant postponing these dates. The Treasury's authority to make additional capital purchases expires at the end of 2009. In addition, the CPP provides a strong incentive for participants to raise private capital to pay off the Government capital injection within 5 years, as the cost of these funds rises over time. That is, the senior preferred shares issued to the U.S. Treasury in the program carry a 5 percent dividend for the first 5 years, rising to 9 percent thereafter.

The FDIC has several programs with preannounced end dates in 2009. The Temporary Liquidity Guarantee Program is a new program that guarantees the unsecured medium-term debt of all FDIC-insured institutions and grants unlimited insurance for non-interest-bearing transaction accounts used by many small businesses. Another program is the expansion of the existing deposit insurance program for savings accounts, checking accounts, and certificates of deposits from $100,000 to $250,000.

Modernizing Financial Regulation

The global financial crisis revealed that current financial regulation standards and practices, in the United States and throughout the world, are ineffective in preventing a major financial crisis that spans countries and different institutions. While no practical system of regulation could likely have prevented such a crisis altogether, a number of important lessons are clear.

Addressing Innovation and Restructuring in Financial Markets

First, financial regulation must be adapted to account for the major innovations and restructuring in financial markets in recent decades. The current U.S. financial regulatory framework is fraught with redundancies and gaps, in part produced by more than one regulator overseeing individual institutions.

Depository institutions, such as commercial banks and savings associations, are overseen by five Federal regulators as well as State regulators. Large holding companies with depository institutions, investment banks, and insurance companies may face a complex system of multiple regulators.

While it is clear that an overhaul of financial regulation is necessary, what is less clear is exactly how a new regulatory framework should be structured. The new financial regulatory framework needs to balance several objectives. Protecting investors and consumers and establishing a stable financial system are two necessary requirements for any successful regulatory system, but regulators must be careful to balance these goals against potential detrimental effects on capital formation and the desire to promote beneficial innovation.

Strengthening Disclosure Requirements

Second, regulators need to strengthen disclosures related to complex financial instruments, particularly those that are held "off balance sheet." A firm's balance sheet is one of many financial statements the firm prepares to provide useful information to investors, creditors, and regulators. The purpose of a balance sheet is to present a snapshot of the firm's financial position. The basic components of a balance sheet are assets, liabilities, and equity. *Assets* are things that provide probable future economic benefit to the firm. *Liabilities* are claims on those assets, such as debt issued to finance the purchase of assets. *Equity* is the residual interest in the assets that remains after deducting the liabilities.

While the above definitions appear straightforward, many questions and issues arise regarding whether certain items should be reported as liabilities or as equity. In addition, questions arise in determining which items should be reflected on the balance sheet at all. The formal accounting standards that are used to distinguish between on- and off-balance-sheet items are very complicated and are open to judgment. As a result, some companies may hold large amounts of off-balance-sheet items that do indeed affect a company's health and stability. For example, at the outset of the financial crisis, some large financial institutions had *structured investment vehicles* (SIVs) holding billions of dollars in mortgage-related assets that were not reflected on their balance sheets.

SIVs are investment funds that issue short-term debt, such as commercial paper, to finance the purchase of long-term assets, such as mortgage-backed securities. Leading up to the financial crisis, SIVs were often highly levered with a great deal of debt relative to their capital. In fact, some SIVs were used to circumvent regulatory capital requirements that restricted the amount of leverage that could be used by the parent financial institutions. In the end, the SIVs' combination of leverage and reliance on short-term funding made

their parent financial institutions vulnerable to large mortgage losses. Many investors were surprised because institutions had disclosed little about the risks posed by the off-balance-sheet SIVs.

The challenge for financial market regulators is to address weaknesses in accounting and disclosure standards for off-balance-sheet items. Once complete and accurate information on the financial condition of firms is disclosed, regulators can more effectively measure firm-specific and system-wide risks. Then regulators can prudently manage those risks as appropriate.

Addressing the Pro-Cyclicality of Regulatory Capital Requirements

Third, problems with pro-cyclical regulatory capital requirements need to be addressed. During good economic times, values of financial assets increase, thus increasing a firm's capital and its ability to increase its liabilities, which helps to feed credit booms. During difficult times, values of financial assets decline. The firm's capital declines in value, and it is forced to reduce its liabilities or somehow increase its capital to satisfy regulatory requirements, which feeds the economic downturn.

The combination of mark-to-market accounting, illiquid markets, and forced sales to satisfy regulatory capital requirements during a downturn can lead to a vicious cycle. *Mark-to-market* accounting is one method for determining an asset's fair value. A *fair value* is the price that would be received if an asset were sold in an orderly transaction between market participants. The mark-to-market approach uses observable market prices to calculate an asset's fair value. An alternative valuation method is the *mark-to-model* approach, which relies on standard financial models that use factors such as interest rates, the probability of default, and related cash flows to calculate an asset's fair value.

Some observers have blamed mark-to-market accounting for driving asset prices well below the values determined by the asset's underlying fundamentals, such as interest rates and probabilities of default. These observers argue that understated asset values undermine investor confidence and have forced many firms to raise capital or sell assets to satisfy regulatory requirements. However, as discussed previously, problems at many financial institutions today are due less to their asset values being undervalued and more to the firms having too many troubled assets (such as MBS), engaging in poor risk management, and becoming too dependent on short-term borrowing. Mark-to-market accounting has helped bring attention to these problems by exposing which firms were very heavily invested in these troubled assets, but it did not cause them.

Investors and regulators can best evaluate a firm when they are aware of the market value of a firm's assets. Transparency is vital to the healthy functioning of financial markets. To effectively address the pro-cyclicality

problem, in which firms may be forced to undertake actions in a downturn that worsen the downturn, financial accounting rules should be distinguished from the regulatory policies that establish standards for capital requirements. The purpose of financial accounting is to provide reliable information about a firm's financial situation so that investors and creditors can make sound economic decisions. From that perspective, mark-to-market accounting is useful because it improves the quality of information in the marketplace.

As noted earlier, some observers have argued that falling asset prices in acutely distressed markets have led firms to report reduced levels of capital. Then, in order to comply with regulatory capital requirements, firms have sold assets, thus driving prices lower. Even if this selling of assets in order to comply with requirements is responsible for the subsequent asset price declines, mark-to-market accounting is not the root cause. Instead, the problem lies with a regulatory policy that is too rigid in determining capital requirements. When most asset values are falling, massive sales of assets to meet the required ratio of capital to assets are likely to be destabilizing. To reduce this problem, regulators could maintain more flexible and forward-looking standards in distressed markets, so that capital requirements themselves do not create unhealthy firms.

The Future of Mortgage Financing and Fannie Mae and Freddie Mac

Over the first half of 2008, investors became increasingly concerned about the capital positions of the GSEs Fannie Mae and Freddie Mac, following a string of quarterly losses by both firms due to reductions in the value of their portfolio holdings of MBS and mortgage loans, and because of greater-than-expected credit losses. Eroding investor confidence in the GSEs endangered not only the U.S. mortgage market but the global financial system more generally, given the central role the GSEs play in mortgage financing and how broadly their debt and MBS are held around the world. At the recommendation of the Administration, Congress passed a bill in July 2008 that, among other things, created a new and stronger regulator for the GSEs, the Federal Housing Finance Agency (FHFA), and provided the Treasury with powers to purchase GSE debt and equity.

In September 2008, Fannie Mae and Freddie Mac were placed under conservatorship of the FHFA as serious concerns surfaced about the financial stability of these systemically important financial institutions. (See "Onset of the Crisis" above.) While conservatorship can provide necessary stability over a period of months, a long-term plan to reestablish the link between mortgage lenders and financial markets is critical to the future of the mortgage market.

Any plan for the long-term restructuring of Fannie Mae and Freddie Mac should have at its core at least three goals: to promote the efficient functioning of the mortgage market, even during periods of systemwide financial stress; to minimize systemic risk, which likely implies that government support should be either explicit or absent; and to protect the taxpayer.

Liquidation of the GSEs and Replacement by a Fully Private Market

One approach is to liquidate the GSEs and allow the private market alone to handle mortgage financing, maximizing the benefits of private market competition. The structure would be one in which private banks and other financial institutions securitize mortgages as a part of their business model, but no single firm would be a dominant player in this market, and the mortgage securitization business would make up only a fraction of the total business of each institution. This solution would dramatically reduce taxpayer risk, maintain a functioning mortgage market in most situations, and eliminate distortions. The elimination of any implicit or explicit government guarantee would, however, increase mortgage interest rates somewhat. This is one reason that the full privatization of mortgage financing may not be the best option in the near term, despite its attractive features.

Importantly, recent experience suggests that fully private financing may not be viable under stressed financial conditions. As an example, the recent financial crisis led to a near-halt in private mortgage securitization in the United States. In contrast, Fannie Mae and Freddie Mac continued to produce and sell large quantities of MBS throughout 2008, with private demand remaining somewhat secure. Apparently, investors valued GSE MBS because of the instruments' implied government support, suggesting that some form of backstop provided by the Government or widely dispersed private reinsurers may be necessary to maintain mortgage financing during periods of systemwide financial stress.

Government-Provided Insurance of MBS

The Government could sell insurance to GSEs and other financial institutions that apply for a charter to create MBS from conforming mortgages. This structure would foster competition among institutions, as the GSEs would have no institutional advantage over private institutions. Such a structure, with its explicit but limited role for government involvement, may be a good near-term solution for mortgage financing. Taxpayers would bear risk, but would be compensated by the insurance premiums paid by participating institutions. Depending on where the price of the insurance is set, the private sector could eventually compete with the Government by offering alternative mortgage products that could replace the Government insurance.

Nationalizing the GSEs

Another GSE structure that has been proposed by some but poses many challenges is nationalization. In this alternative, the GSEs could be taken out of conservatorship and be fully nationalized. As government corporations, they would be set up to guarantee conforming mortgages or MBS directly. What is less clear is how nationalization would be accomplished: Would the GSEs' debt become the Government's debt? What would happen to the equity held by existing shareholders? In addition, if Government prices for this guarantee were below the costs incurred by private markets, private competition for securitization would be precluded. Although systemic risk would be eliminated and the GSEs would have little incentive to engage in excessively risky behavior for short-run profits without shareholders, taxpayers could bear substantial risk. Finally, the terms of mortgage financing would be set by the Government, a role that can be fulfilled by the private sector.

Turning the GSEs into a Public Utility

Alternatively, Fannie Mae and Freddie Mac could be combined and turned into one public utility. This regulated private corporation would directly issue MBS, presumably with some government backing. Prices of the MBS and their rates of return would be set by a commission, and regulations would place tight limits on the company's investment portfolio. Public utilities are generally established in natural monopoly settings (because, for example, building duplicate telephone or power lines is inefficient) as a second-best solution to prevent monopoly pricing and guarantee public service. The mortgage market is not a natural monopoly, however, and can be easily served by many firms without duplicative inefficiency. As a consequence, a public utility would result in many distortions and disadvantages without significant offsetting positives.

Implicit Guarantees

The issue of distortions arising from implicit government guarantees is not limited to Fannie Mae and Freddie Mac. An increasingly important source of financing for depository institutions in recent years has been the Federal Home Loan Banks (FHLBs). As of the third quarter of 2008, the FHLBs had granted nearly $1 trillion in loans. These loans, often backed by real estate–related collateral, have been extended to the majority of depository institutions in the United States. The FHLBs raise funds at below-market rates because they have advantages over other debt issuers, such as certain exemptions from State and local taxes and an assumed implicit government guarantee even though the FHLBs are private member-owned cooperatives. Some of these savings are passed along to member banks, who, as a result,

rely—in some cases very heavily—on financing from the FHLBs. Any long-term plan for mortgage financing must eliminate the distortions in credit markets created by implicit guarantees of this nature.

Conclusion

The United States experienced a crisis in both financial markets and housing markets in 2008. One factor that led to this crisis was an abundance of inexpensive capital that helped finance a housing boom. This boom was fueled by the growth of subprime mortgages and expanded mortgage securitization. As the boom proved unsustainable, the crisis was exacerbated by unprecedented declines in house prices, rising default rates on residential mortgages, and a resulting sharp decline in the value of mortgage-related assets. The assets were held by a wide range of institutions, some of which were highly levered and highly dependent on short-term funding. The resulting failure and near-failure of some of these firms, combined with broad-based declines in asset prices, placed enormous stresses on world financial markets. Credit markets froze, and confidence in the financial system eroded.

The Administration and the Federal Reserve aggressively responded to restore stability to the U.S. financial system and support the functioning of financial markets and firms. The Government has taken unprecedented action to boost liquidity in short-term funding markets; provided substantial new protections for consumers, businesses, and investors; and cooperated closely with its international partners. Looking ahead, the global financial crisis presents several challenges for the United States. Among them are the need to improve financial regulation, unwind temporary programs in an orderly fashion, and develop long-term solutions for Fannie Mae and Freddie Mac.

CHAPTER 3

Energy and the Environment

Although fossil fuels will continue to compose a large share of the U.S. energy portfolio for some time, the Federal Government has taken major steps to increase and diversify the Nation's energy supply and improve the environment. Since 2001, the Government has made significant investments to develop cleaner and more reliable energy sources. Several regulatory changes are expected to deliver dramatic improvements in air quality nationwide. The President has signed two major pieces of energy legislation, the Energy Policy Act (EPACT) of 2005 and the Energy Independence and Security Act of 2007 (EISA). EISA was enacted in response to the President's "Twenty in Ten" goal, issued in the 2007 State of the Union Address, of reducing U.S. gasoline usage by 20 percent in the next 10 years by improving fuel economy and increasing the production of alternative fuels. EISA also includes numerous energy efficiency mandates that are projected to result in substantial reductions in greenhouse gas (GHG) emissions. In addition, the Nation is on track to meet—and currently projected to exceed—the President's 2002 goal of reducing U.S. GHG intensity (emissions per unit of GDP) by 18 percent by 2012. This spring, the President set a new goal of stopping the growth in total U.S. GHG emissions by 2025 and to begin decreasing them thereafter. The Administration has also recently led efforts to encourage wider international action on addressing GHGs, including action in developing countries.

Despite these steps by the Administration to address the problems associated with the country's reliance on fossil fuel–based energy sources, major challenges remain. For public health and environmental reasons, the United States must continue to improve air quality by ensuring that State and local areas come into compliance with Clean Air Act (CAA) requirements. Additional steps should be taken to mitigate the global problem of rising GHG emissions associated with fossil fuel–based energy consumption. Furthermore, diversifying the Nation's portfolio of energy sources and increasing domestic production may reduce vulnerabilities associated with the U.S. dependence on imported fossil fuels.

This chapter discusses policies for addressing the Nation's energy needs in the context of both global climate change and the reduction of local and regional pollution associated with fossil fuel–based energy use. It reviews some of the steps this Administration has taken to advance the transition to new sources of energy with fewer environmental and security concerns, and to find cleaner, more efficient methods of using existing energy sources. It

also identifies some of the overarching challenges that lie ahead in developing any comprehensive energy policy.

The key points in this chapter are:

- Because of innovative regulations promulgated under this Administration, there should be substantial improvements in air quality over the next few decades. Two rules that implemented cap-and-trade programs in the electricity sector represent a significant step in using cost-effective, market-oriented policy instruments to dramatically reduce power plants' emissions of sulfur dioxide, nitrogen oxide, and mercury.
- Despite widespread support for increased use of market-based approaches to achieve our environmental and energy policy goals going forward, challenges remain in realizing the full potential of these approaches.
- There is an increasing need to reassess how well existing laws can address the environmental problems associated with fossil fuel use in more cost-effective ways. For example, it may become increasingly costly to make additional reductions in traditional air pollutants, and existing statutes were not meant to regulate global problems such as GHG emissions.
- Substantial reductions in global GHG emissions will require participation by all large emitters (countries and sectors within countries).

U.S. Energy Use and Policy Goals

Fossil fuels continue to satisfy the majority of the Nation's demand for energy. Petroleum accounts for about 40 percent of total energy consumption; 70 percent of this petroleum is used for transportation. Coal and natural gas are the next most commonly used fuel types, representing 22 percent and 23 percent of consumption, respectively. Coal is used almost exclusively for electricity production; approximately a third of natural gas consumption is also used in electricity production, with the remaining two-thirds being used directly by residential, commercial, and industrial sources. Finally, nuclear power and renewable energy sources such as hydropower, biomass, geothermal, wind, and solar power remain a small but growing share of our energy consumption, with nuclear power accounting for approximately 8 percent of U.S. energy consumption in 2007 and renewable energy accounting for approximately 7 percent. (See the 2*008 Economic Report of the President* for more details on U.S. energy sources.)

The Nation's current patterns of energy use pose a number of problems that warrant government involvement in energy markets. One is the concern over the public health and environmental effects of fossil fuel–based energy production and use. In particular, the emission of many common air pollutants that are created by the combustion of fossil fuels increases the risk of

premature mortality and numerous acute and chronic health conditions. Additionally, these emissions damage ecosystems, impair visibility, and have a substantial impact on water and soil quality. In this chapter, "common air pollutants" refers to the so-called *criteria pollutants* (particulate matter (PM), ozone, nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO), and lead), although much that is written about the criteria pollutants also applies to hazardous air pollutants or air toxics.

As in many other countries, anthropogenic (human-made) U.S. GHG emissions continue to increase. Because of the environmental risks posed by climate change and the national security implications of events like droughts and rising sea levels, many countries have grown more aware of the need to slow and reverse the growth of global emissions of carbon dioxide (CO_2) and other greenhouse gases. In 2007, total U.S. GHG emissions were 7,282 million metric tons of CO_2 equivalent (MMTCO2e), a 3-percent increase over 2000 levels; this increase is mainly attributable to energy use. Energy-related CO_2 emissions account for 98 percent of U.S. CO_2 emissions and more than 80 percent of total U.S. GHG emissions. The United States represented about 17 percent of world GHG emissions in recent years.

For energy security reasons, concerns also remain about the U.S. reliance on imported fossil fuels. Net oil imports to the United States account for a substantial share of national oil consumption, which many argue makes the United States economy more vulnerable to oil price shocks that are the result of supply disruptions in unstable exporting regions. However, as economists have pointed out, it is important to remember that it is primarily U.S. oil dependence, rather than U.S. dependence on imported oil, that exposes the country to turmoil in world oil markets. Given the integrated nature of the oil market, a supply disruption in one region still removes oil from the world market causing the price of oil to rise regardless of where it was produced.

Despite a weak economic outlook for 2009, projections indicate that energy consumption in the United States and around the world will continue to grow in the long run. Thus, we will need to continue to determine how to meet these needs while both addressing energy security concerns and improving environmental protection. It is clear that long-term policies aimed at reducing the Nation's overall reliance on fossil fuels can help to advance both goals. However, taking intermediate steps that help us use fossil fuels in more responsible ways during the transition to alternative sources of energy is still consistent with this long-term objective. For example, this Administration has supported removing regulatory impediments to bringing domestic energy sources, including fossil fuels, to market, to advance energy security objectives. It has also supported finding cleaner ways of using fossil fuels. Some of the Administration's efforts on each of these fronts are covered later in this chapter. Before that, the next section provides a brief overview of policy approaches for addressing these objectives.

The Promise of Market-Oriented Policy Approaches

This section reviews the advantages of market-oriented policies, while noting some of the challenges that must be overcome to use them most effectively in tackling some policy objectives such as climate change. This section also discusses the role for policies supporting research and development and widespread adoption of new technologies that pose fewer environmental or security concerns.

Market-Oriented Environmental Regulation

Regulatory approaches for addressing the policy goals outlined above are often grouped roughly into two categories: conventional, or *command and control* approaches, and market-oriented approaches. Conventional approaches to reducing pollution, for example, tend to involve policy instruments that mandate the amount individual entities can emit or prescribe which abatement behaviors or technologies should be adopted. These types of policies are often called command and control approaches because they offer little flexibility about how a particular environmental goal may be met (although, among command and control approaches, performance-based standards can offer a bit more flexibility in achieving abatement goals than do technology-based standards). Market-oriented approaches, by contrast, encourage behavior through price signals rather than with explicit standards on pollution-control levels or methods. Policy tools such as tradeable permits or taxes, for example, offer firms an incentive to reduce their pollution by placing a price on each ton of pollutant emitted.

The primary advantage of market-oriented policies is that, if they are designed well and properly implemented, they have the potential to achieve environmental goals at a lower cost to society than traditional command and control policies. This is because of the greater flexibility they offer in determining how to reduce emissions. If emitters can choose the method of pollution reduction, they have an incentive to find the lowest-cost way to meet the regulatory requirement. For example, policymakers could require producers and consumers to take into account the environmental and public health effects of a criteria pollutant like sulfur dioxide by imposing a tax on emissions that is equal to the incremental damage caused by a unit of emissions or by establishing a *cap-and-trade* program, under which policymakers set an overall cap on emissions but allow regulated entities to trade rights (called *allowances*) to those limited emissions. Since the cost of reducing emissions may vary across firms and sectors, what may be the least expensive approach for one firm may be a relatively high-cost approach for another

firm. Emitters that can reduce emissions most inexpensively will do so and then sell allowances to those who face much higher abatement costs. As a result, the most economically efficient allocation of the pollution-control burden among emitters can be achieved without requiring the policymaker to make assumptions about how compliance costs may vary across firms.

Another significant advantage of market-oriented approaches is that they can provide a greater incentive to develop new ways to reduce pollution than can command and control approaches. Command and control policies often offer incentives to abate only to the level of the standard, whereas a pricing approach encourages emitters to continue to innovate as long as they find it relatively cheap to do so. Well-designed pricing of CO_2 emissions through a tax or cap-and-trade program, for example, would give firms a direct incentive to invest in developing new low- or zero-carbon technologies based on their expectations of the increases in the costs of emissions. It would also encourage competition in making incremental innovations in existing emission reduction options. Of course, it will be important to address hurdles in providing the infrastructure necessary to allow large-scale deployment of new technologies, a point to which we return below.

Both of these advantages have created widespread support among economists for greater use of emission pricing policies to address environmental problems, including those problems associated with fossil fuel–based energy use. However, it is important to emphasize that challenges remain in realizing the full potential of market-oriented policy approaches. This is especially true in the context of climate change. Carbon pricing through a cap-and-trade system or, closely related, by taxing fossil fuels in proportion to their carbon content, will require broad-based participation to be effective in addressing global GHG concentrations. Limited action that does not result in emissions reductions from countries that contribute a significant share of world emissions will not lead to significant progress on climate change goals, since the majority of the future growth in emissions will come from developing nations. Absent action by all major emitting countries, it will be impossible to have a meaningful impact on the problem. Also, without similar policies across these countries, firms in energy-intensive industries that face high regulatory costs in the U.S. could have an incentive to move their operations to unregulated foreign markets. These issues and other challenges in implementing more economically efficient policies are discussed in greater detail below.

The Role for Technology Inducement Policies

Another method policymakers often use to give incentives for taking into account the environmental or security consequences of a particular behavior is to subsidize behavior that poses fewer environmental or security concerns.

For example, similar to the way a business reacts to a price signal such as an emissions tax, a profit-maximizing business will abate pollution or invest in research and development (R&D) in cleaner technologies up to the point where the cost is more than the subsidy or reward earned for doing so. This is not to imply that a tax and subsidy are equivalent policies. A tax generates revenue that can be used to offset other preexisting distortionary taxes (such as payroll taxes) in the economy, whereas a subsidy requires that revenue be raised by increasing existing taxes or requires reducing spending in other areas. Still, many economists maintain that, as a complement to any pricing policy, governments will need to support R&D for alternative energy sources and ensure that any R&D support is managed efficiently and effectively. These policies may be justified on economic grounds primarily because the process of generating and diffusing new energy technologies is characterized by imperfect market outcomes. The most significant of these is the general underinvestment in innovation due to the pure public-good nature of R&D. Because devoting a firm's resources to innovation may yield *knowledge spillovers*—benefits to society that do not translate into profits for the innovating firm—there may be an inefficient, low level of R&D in alternative energy technologies. This problem has long been recognized in all industries, and there are numerous policies in place to help innovators reap the rewards of their innovations (for example, patents, copyright laws, funding for general science research).

In assessing the desirability of public sector support for research and development, one might consider the extent to which private sector incentives for R&D already exist. Private incentives for R&D investment may vary across categories of prospective R&D:

- *Emission control for currently regulated pollutants.* In this case, there are regulatory incentives for the private sector to develop technologies that control emissions, but there will only be incentives to develop technologies that reduce emissions in ways captured by regulation.
- *Energy efficiency, new energy sources, and alternative energy.* Since energy is an expensive input, there are strong private sector incentives to develop new or improved technologies even without any government regulation. Support for public sector R&D in this area would be specifically justified if individual producers and consumers do not account for the broader value of energy security or of positive spillovers to others from the technology that goes with the new alternative.
- *Emissions from pollutants that are not currently regulated.* In this case, the incentive for private sector R&D is very limited, because prospective developers are not only uncertain about whether their new invention will work, but also must consider if or when the pollutant will be regulated, and whether their technology will be acceptable under future regulations.

Technologies to reduce emissions of non-CO_2 greenhouse gases are among those that are not currently regulated, as are technologies that would capture and store such gases to prevent them from entering the atmosphere.

It is important to highlight that domestic R&D support for alternative technologies may also help create incentives for action on climate change by other major emitting countries that are unwilling or unable to adopt GHG-reducing regulations. For example, investment in developing low-cost, low-carbon technologies could lead to inventions that such countries would adopt voluntarily. Additionally, it is often argued that production costs of new, unproven technologies fall as manufacturers gain production experience. If the gains from such "learning by doing" experience can be captured by other producers without compensating the early adopters, then there may be inefficient, low deployment of new technologies.

The difficulty in promoting technology adoption through subsidies and other tools lies in designing policies that are neutral across all alternative technologies. Weighting the size of a subsidy by the degree to which each technology reduces environmental and security concerns would help to ensure that the Government is not in the position of picking winners. In April 2008, the President called for a reform of the existing low-carbon technology deployment tax incentives into a single, expanded incentive with such features. We return to this issue below. Overall, there is less agreement among economists about the justification for these types of policies that target the commercial use of a technology than those that target the R&D stage of the technology innovation process. Many argue that once fundamental research is no longer necessary, the market should decide how widely a new technology is adopted.

Increasing Use of Alternative Energy Sources

There are many alternatives to fossil fuels available for meeting our energy needs in the electricity, transportation, and other sectors. Electricity may be generated using renewable sources (such as wind, solar, geothermal, biomass, and hydropower) or nuclear power. In the transportation sector, solutions range from finding new fuels for traditionally gas-powered vehicles to designing different types of vehicles such as those that run on electricity or hydrogen. Policy tools used under this Administration to promote the transition to some of these alternatives can be grouped into two categories: technology policies that provide incentives to encourage R&D and deployment of new technologies, and mandates that require increases in alternative energy use.

Generating Electricity

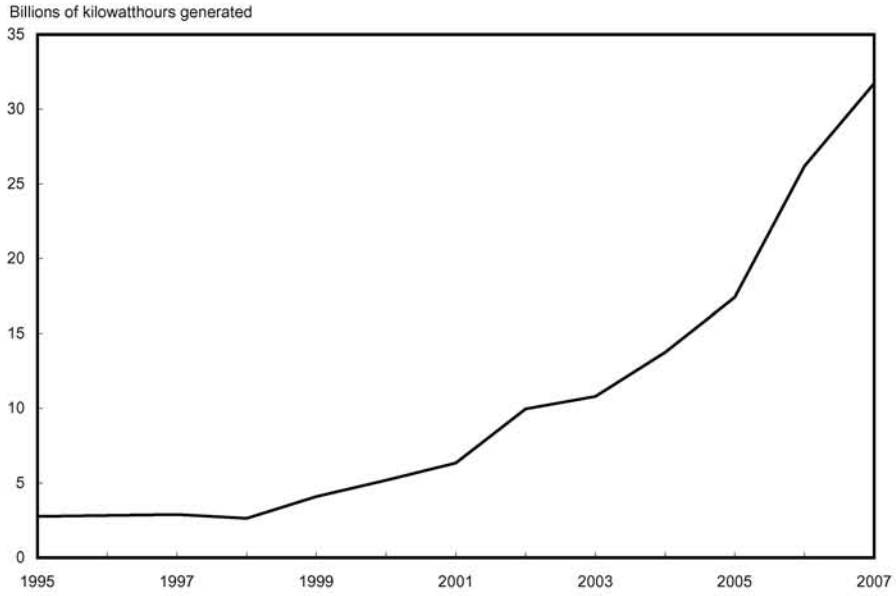
In the electricity sector, the Administration has supported development of alternative energy technologies through a mix of incentives, including both basic research investment and technology deployment policies. Department of Energy funding for electricity-related R&D, for example, totaled $11.5 billion (2007 dollars) from fiscal year 2002 through fiscal year 2007. This section reviews some of the existing incentives for promoting electricity generation from renewable energy sources and nuclear power.

Renewable Energy

Renewable sources of energy such as wind, solar, and geothermal power are desirable for generating electricity because, despite their high initial fixed costs, they are domestic sources of power with no fuel costs or emissions except those involved in building the infrastructure required to generate the power. Biomass-fired electricity, which is derived from sources such as wood, waste, and alcohol fuels, is also a renewable source. While not technically a zero-emission process, biomass energy produces fewer common air pollutants than coal and, depending on the feedstock and firing process, has the potential to create fewer GHG emissions than either conventional coal or natural gas. This Administration has encouraged deployment of renewable energy technologies in electricity generation primarily through tax incentives. For example, the renewable energy production tax credit (PTC) has been important in encouraging the growing market for wind power. Although wind still provides only 1 percent of the United States's electricity, wind generation has grown by about 400 percent since 2001 and, in 2007, made up 10 percent of electricity generation from renewable energy sources (see Chart 3-1). This growth is in part because, in some areas, the PTC makes the cost of wind more competitive with other energy sources such as natural gas. Incentives and requirements for renewable energy use in numerous States are also contributing to the increase. The Federal PTC has been renewed and expanded several times since its original enactment in 1992, including by EPACT 2005 and again in October 2008. It is currently available for a broad range of renewable sources such as solar power; certain geothermal, landfill-gas, and biomass projects; ocean energy; and livestock methane-based power.

Renewable energy deployment is also encouraged through tax credits for investments in renewable energy equipment and property. For example, the Energy Policy Act of 2005 (EPACT) increased the solar investment tax credit (ITC), which offers businesses a tax credit for investments in solar energy equipment and installations. The 21-percent increase in solar powered electricity generation capacity between 2006 and 2007 may indicate that the solar ITC is having some effect. In order to provide clear and consistent incentives for technology investment, policies such as the PTC should be maintained for a

Chart 3-1 **U.S. Wind Power Generation, 1995–2007**
U.S. wind power generation has soared in recent years and capacity grew further in 2008.



Source: Department of Energy (Energy Information Administration).

reasonable length of time but be phased out once they are no longer warranted to address barriers associated with the early commercialization of a technology.

It is worth noting that renewable energy sources, especially wind and solar, face infrastructure obstacles because many large-scale renewable energy installations are most likely to be built in remote areas. Also, neither wind nor solar can currently be relied on as a consistent means to produce energy 24 hours a day. The challenges of bringing these resources to market and finding better ways to store energy are discussed in more detail later in the chapter.

Nuclear Power

In addition to renewable energy sources, the Administration has promoted increased use of nuclear power as a clean, efficient energy source to meet the Nation's growing need for electricity. Nuclear power is not a new technology. Currently, 104 commercial nuclear generating units (reactors) in the United States supply approximately 20 percent of the country's electricity. Nuclear power generation makes no contribution to global CO_2 emissions and produces no notable emissions of SO_2, NO_X, and particulates. In addition, nuclear plants have low operating costs and are able to operate at close to full capacity all the time, thus providing a reliable, constant supply of electricity. Despite these advantages, high construction costs, investment risks, long-term management of spent fuel generated by nuclear plants, and regulatory

hurdles have deterred any new commercial reactors from being ordered and approved for construction since 1978. The last new nuclear plant came on line in 1996.

The Administration has taken several steps to address some of the concerns that are barring greater use of nuclear energy. EPACT 2005 provided a new production tax credit to reward investments in the latest developments in advanced nuclear power generation. Since then, the Nuclear Regulatory Commission has received 17 applications for combined construction permit and operating licenses for 26 new nuclear generating units.

As part of EPACT, the President also authorized the creation of loan guarantee programs to encourage commercial use of new or significantly improved energy related technologies, including nuclear power. In 2008, Congress authorized loan guarantees worth over $18 billion to support construction of new plants and enable nuclear plant owners to reduce their interest costs. A loan guarantee is a promise by the Government to take responsibility for a certain portion of a loan in case the debtor defaults. By assuming some of the risk associated with loans for new projects, these guarantees are implicit subsidies for new nuclear energy projects. If priced appropriately, loan guarantees can help to encourage early commercial use of new technologies that had been hampered by informational asymmetries between project developers and lenders. However, such guarantees should be used with caution. If the Government assumes too much of the financial or political risk associated with a new project, investors may attempt to embark on speculative projects that could end up being costly for taxpayers. This same caution applies to loan guarantee programs available to support other energy sources such as renewable and/or energy-efficient systems, cleaner coal-based power, and other technologies.

Alternative Transportation Fuels

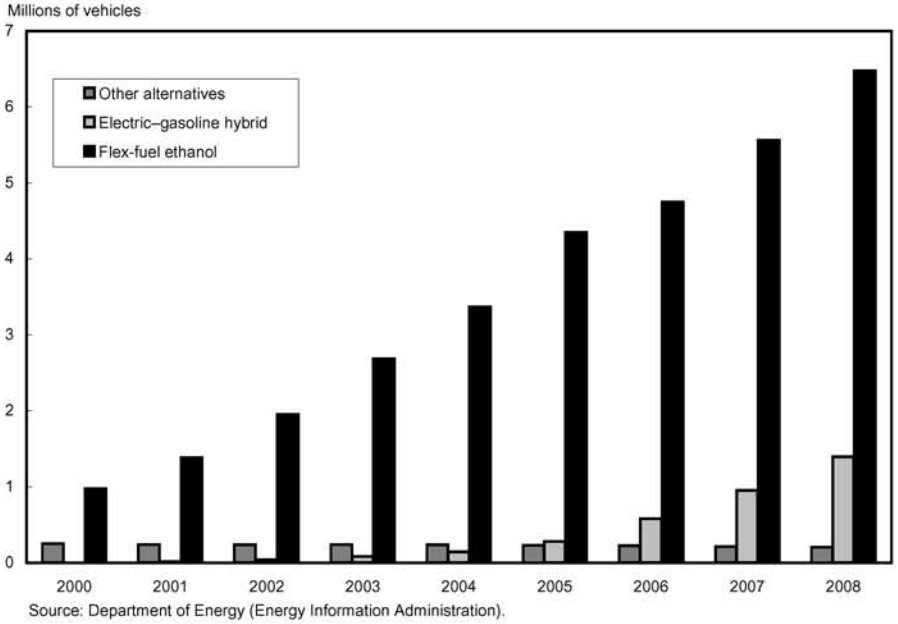
Petroleum use in road travel dominates energy consumption in transportation. In recent years, tax incentives have increased the use of some alternatives to petroleum, especially corn-based ethanol, but there has been an increasing emphasis on promoting alternatives that do not rely on food crops and have greater promise for significantly reducing GHG emissions. The Administration's efforts in this area have focused on providing incentives and funding to develop new vehicle technologies and reliable, low-cost alternative fuels to conventional gasoline and on mandating increased use of renewable fuels, including biofuels from non-food sources.

Incentive-Based Promotion of Alternative Fuels

Federal R&D support for alternative fuels has been led by a $1.2 billion investment (over 5 years) in hydrogen-based fuel cell vehicles and about

$1 billion since 2001 in cellulosic ethanol—an ethanol produced from wood, grasses, or the nonedible parts of plants. These fuels face significant cost hurdles which currently prevent them from being commercially viable. The benefits of R&D in hydrogen vehicles will take a long time to be realized because the vehicles still face formidable technological obstacles that may take decades to resolve. The projected cost of cellulosic ethanol, however, has dropped by more than 60 percent since 2001. If these cost reductions continue, cellulosic ethanol may become a viable transportation fuel more quickly than alternatives like hydrogen. Aided by the Corporate Average Fuel Economy (CAFE) credit given to manufacturers for producing "flex-fuel" vehicles that can run on either all gasoline or up to 85 percent ethanol, the number of light-duty vehicles that can accommodate large amounts of ethanol has grown by more than 5 million since 2001 (see Chart 3-2). However, as with other types of biofuels, significant economic, scientific, environmental, and logistical challenges remain with incorporating nationally significant volumes of cellulosic ethanol into the market. Fuel distributors and gas station owners will need to make significant investments in the infrastructure for new fuel distribution and manufacturers will need to make changes to vehicles to accommodate substantially larger biofuel volumes; existing gas station infrastructure and non-flex-fuel vehicles are currently only compatible with gasoline blends consisting of up to 10 percent ethanol.

Chart 3-2 **Alternative Fuel Light-Duty Vehicles in the U.S. Fleet**
Flex-fuel vehicles, capable of burning up to 85% ethanol, have led U.S. growth in alternative-fuel vehicles.



Source: Department of Energy (Energy Information Administration).

Another alternative technology that shows more near-term promise in reducing gasoline consumption is electricity for powering vehicles. The consumer tax credits created under EPACT in 2005 for purchasing electric—gasoline hybrid vehicles have helped to encourage hybrid sales, and there are now more than 1 million hybrid vehicles on the road. The so-called "plug-in hybrid" design takes this technology a step further by using the gas engine only for back-up status and letting the electric motor do most of the work. This is possible because the large battery pack of the plug-in hybrid can be recharged using a standard household outlet. The cost of the battery pack is a major hurdle to widespread commercialization of these vehicles. Between 2001 and 2008, the Department of Energy helped to advance battery technology with about $230 million in funding for energy storage R&D.

Replacing gasoline with electric power helps address energy security concerns by increasing the use of domestic, non-petroleum energy sources to meet our transportation needs. It does not eliminate GHG concerns or emissions of many local pollutants if the electricity is generated using fossil fuels, but it does reduce these concerns as well. Electric vehicles with more efficient alternating current systems would produce fewer CO_2 emissions per mile than most conventional gasoline vehicles if powered by electricity from a coal-fired power plant. CO_2 emissions per mile driven would be significantly lower than with gasoline if the electricity were generated with natural gas. This would also result in fewer emissions than powering a car directly with natural gas, which has shown greater use as an alternative to diesel in heavier trucks or buses. It will still be necessary to modernize and expand the electricity grid to accommodate substantial increases in electric power usage in the transportation sector. The challenge of expanding electricity transmission is discussed in more detail below.

Renewable Fuels Standard

In addition to using incentives to promote alternative fuels, the Administration has also acted to mandate increased use of alternatives to petroleum in transportation. In 2007, the President announced the Twenty in Ten goal to reduce U.S. gasoline use by 20 percent in 10 years. The passage of the Energy Independence and Security Act of 2007 (EISA) represents a major step toward this goal by requiring substantial increases in light-duty vehicle fuel economy standards and an increase in the production of renewable fuels.

The renewable fuels standard (RFS) portion of EISA is an expansion of the first RFS the President signed into law as part of Energy Policy Act of 2005 (EPACT), which required a minimum volume of renewable fuel to be sold or blended with gasoline in the United States. EISA raises the 2008 standard from 5.4 billion gallons to 9 billion gallons and increases the requirement each year thereafter, until reaching 36 billion gallons of renewable fuel

by 2022. Beginning in 2009, about 5 percent of the RFS must be met with advanced biofuels—such as cellulosic ethanol made from switchgrass or wood chips or biodiesel made from leftover restaurant grease. By 2022, nearly 60 percent of the RFS-mandated volume must come from advanced biofuels. These advanced biofuels hold greater potential for reducing GHG emissions than current U.S. biofuels and are also less likely to affect future food prices because they are not reliant on food crops as feedstock, although some advanced biofuels may compete for land and other inputs with food crops. However, minimizing the negative environmental impacts (for example, on soil, water quality, forest cover, habitat diversity, and increased GHG emissions from land-use changes) of biofuel production is likely to remain a significant challenge regardless of the type of feedstock. Furthermore, while the RFS will lead to an increase in the use of biofuels, the expected reduction in gasoline consumption (and associated emissions) will likely be dampened due to unintended consequences. For example, gasoline consumption may increase in other countries due to a rebound effect from lower demand in the United States.

The risk of food-price spikes resulting from a binding RFS mandate could be mitigated by establishing a "safety valve" mechanism that would effectively cap the cost of meeting the mandate. With such a mechanism, a refiner or fuel blender would be allowed to purchase credits from the Government to satisfy its RFS requirement if biofuel prices exceeded a predetermined safety-valve price. This would prevent drastic shocks in food prices and also offer more regulatory certainty to refiners, blenders, and biofuel producers. Despite the Administration's support for a safety valve in the RFS mandate, the final version of EISA did not include such a provision.

Harnessing Existing Energy Sources More Responsibly

Given the economy's overwhelming reliance on fossil fuels, it is reasonable to assume that it will take some time to transition to alternative sources of energy. Therefore, in addition to supporting the development of alternatives described above, the Administration has led a parallel effort to promote cleaner, more efficient, and more reliable use of existing sources, including fossil fuels.

Increasing Efficiency

Efforts to use existing energy sources more efficiently have focused on improving efficiency in vehicle fuel use and in electric energy consumption through fuel economy standards on new cars and light trucks and through various lighting and appliance standards.

Vehicle Fuel Economy Standards

The EISA Vehicle Fuel Economy Mandate builds on the Department of Transportation's 2003 and 2006 fuel economy rules for light-duty trucks and requires that the light-duty vehicle fleet (new cars and light trucks) meet a Corporate Average Fuel Economy (CAFE) standard average of 35 miles per gallon (mpg) by 2020. The 2003 rulemaking increased fuel economy standards of new light trucks by 7 percent between 2004 and 2007 model-years, and the 2006 rulemaking required an additional 8 percent increase, bringing fuel economy of new light trucks to 24 mpg by model year 2011. The 2020 requirement represents approximately 40-percent increase in miles per gallon over 2008 standards: 27.5 mpg for passenger cars, and 22.5 mpg for light trucks. Several new credit trading and banking provisions will help reduce the cost to manufacturers of meeting the new standards and are an example of the use of market-based mechanisms. Under EISA, manufacturers whose vehicles exceed minimum CAFE standards can sell credits to other manufacturers below the standards, and companies can transfer credits between their car and light truck fleets. Companies are also permitted to carry credits forward for 5 years (instead of the current 3 years), which should encourage earlier introduction of new technologies and overcompliance in the initial years. In addition, EISA provides $25 billion in loans to the auto industry to assist in meeting the new CAFE standards. In April 2008, the Department of Transportation issued a proposal to raise fuel economy standards more rapidly than required by EISA.

In addressing potential energy security concerns, the advantage of CAFE over some other policies is that it encourages reductions in gasoline consumption, thus reducing not only oil imports but also the economy's overall reliance on oil. However, increased CAFE standards do nothing to reduce externalities related to miles driven (congestion, accidents, noise, local pollution) and will in fact increase these slightly as the per mile cost of driving falls. In addition, since regulations like CAFE standards that differentiate based on a vehicle's age make new vehicles less attractive than existing vehicles, the regulation may delay the turnover of the vehicle fleet and reduce the realized environmental benefits of the tighter standards. For such reasons, many economic analyses suggest that higher fuel taxes may be a more efficient solution to the negative externalities related to fuel consumption. As noted in Chapter 9, congestion pricing may also be a better way than CAFE to address many of the negative externalities associated with driving.

In the absence of other policies, increasing fuel economy standards will help reduce gasoline consumption and greenhouse gas emissions. It is also likely, as recent trends suggest, that higher fuel prices may persuade consumers to buy more fuel-efficient vehicles even before the higher mileage standards take full effect.

In addition to increasing the fuel economy of our vehicles, fuel efficiency may be increased by targeting inefficiencies at other points in the transportation network. For example, municipalities have saved millions of gallons of fuel and abated associated CO_2 emissions by monitoring and retiming their traffic signals and have seen significant returns on their signal-management investments (see Chapter 9).

Electric Energy Efficiency

The final set of mandates included in EISA is aimed at improving energy efficiency in electricity use. The Lighting Efficiency Mandate will essentially phase out the sale of incandescent light bulbs by 2014 and improve lighting efficiency by more than 65 percent by 2020. The Appliance Efficiency Mandate sets over 45 new standards for appliances. The Federal Government Operations Mandate requires Federal agencies to reduce the energy intensity of their facilities by 30 percent from 2003 levels by 2015 (an increase over the 20 percent reduction requirement set by EPACT 2005). EISA also revised the Federal Building Energy Efficiency Performance Standards so that fossil fuel-generated energy use is phased out of new Federal building designs by 2030. While these requirements will undoubtedly deliver efficiency improvements, reductions in fossil fuel use through these and other types of efficiency standards will be dampened by population and economic growth. In fact, the Energy Information Administration projects that net electricity consumption will still increase nearly 30 percent by 2030 even after accounting for the EISA efficiency standards. Furthermore, as in the case of vehicles, it is important to remember that improvements in electric efficiency will reduce energy cost per kilowatthour, resulting in some increased use of lighting, air conditioning, and other electricity-using activities. This rebound effect thus dampens somewhat the overall impact of the EISA mandates.

There are numerous other promising opportunities to make our electricity generation, distribution, and consumption more efficient and reliable. According to the Energy Information Administration, the U.S. electricity-generation system converts only one-third of total energy inputs into usable electricity, and about 9 percent of this electricity is lost during transmission and distribution. One way to increase the efficiency of the system would be through the use of a so-called "smart electricity grid." A smart grid could be able to receive power back from clients. It would thereby allow greater integration of renewable generation resources and facilitate distributed electricity generation from small-scale sources such as home photovoltaic panels and micro-turbines during peak demand times. Using a two-way communications system, a smart grid would also allow consumers in areas where electricity prices rise and fall based on real-time demand to shift energy consumption from high-priced peak demand periods to low-priced off-peak periods. Finally, by enabling near real-time monitoring of electricity

use, a smart grid would give utility companies more time to detect faults and take steps to prevent the possibility of a blackout. These steps could include alerting consumers about reducing energy consumption during emergency periods of peak energy usage. Recent estimates suggest that deployment of smart-grid technologies could potentially reduce America's annual electricity usage by up to 4.3 percent by 2030.

The Department of Energy is undertaking many smart-grid planning, implementation, and awareness activities. EISA also authorized up to $100 million per year over the next 5 years for a smart-grid demonstration initiative to demonstrate the potential benefits of advanced grid technologies; to facilitate commercial transition from the current system to advanced technologies; and to improve system performance, power flow control, and reliability.

Cleaner Use of Fossil Fuels

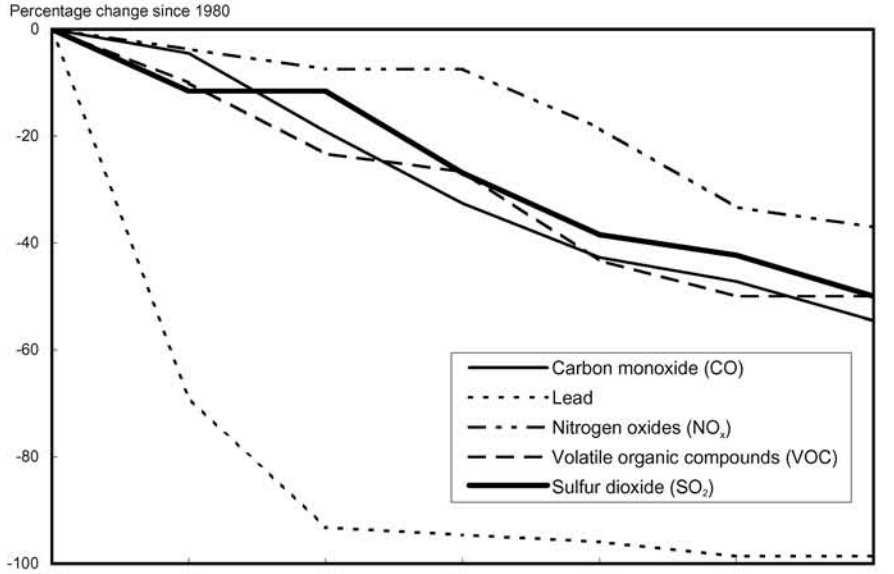
The recent mandates for increased energy efficiency have been further supported by policies promoting cleaner use of fossil fuels, including numerous regulations targeting local and regional air pollution and technology deployment incentives, such as tax incentives for advanced coal technologies.

Regulating Local and Regional Air Pollutants

Regulations directed at local and regional air quality problems are and will continue to be linked to policies to reduce GHG emissions. These policies often provide co-benefits to each other. For example, to the extent that regulations that target common air pollutants in the transportation sector lower fossil fuel use and make fossil energy cleaner, they also contribute to more secure energy with less environmental harm. Similarly, significant air quality benefits can be expected from climate change mitigation policies. (Note that the reverse may not be true, since pollution-control equipment consumes power, which requires greater fossil fuel use (and CO_2 emissions) to generate the same amount of usable energy.) There may be additional savings from reduced investment in local air pollution controls (such as equipment to reduce the amount of nitrous oxide (NO_X) and sulfur dioxide (SO_2) released into the air from coal-burning power plants) under a future GHG emission pricing policy that reduces the use of fossil fuels.

According to a number of indicators, air quality has improved dramatically over the past few decades. As shown in Chart 3-3, emissions of many common air pollutants have decreased, and these trends have continued through this Administration. For example, between 2000 and 2007, NO_X and volatile organic compounds (VOC) emissions (the primary precursors to ground-level ozone) fell by 23 percent and 12 percent, respectively, and SO_2 emissions fell by 19 percent.

Chart 3-3 **Emissions Levels over Time**
Emissions of common air pollutants have declined substantially since 1980.



Source: Environmental Protection Agency.

Over the past decade, the Environmental Protection Agency (EPA) has finalized—and is implementing—a suite of regulations on light- and heavy-duty vehicles and engines and nonroad mobile sources (such as construction, agricultural, industrial equipment, locomotives, and marine engines) that are transforming the diesel engine. The 2004 Clean Air Nonroad Diesel Rule, for example, is expected to reduce emissions from new nonroad diesel equipment (such as tractors and bulldozers) by over 90 percent from 2004 levels by 2014 and to reduce sulfur levels in nonroad diesel fuel by 99 percent from 2004 levels by 2010. The Administration has also strengthened the National Ambient Air Quality Standards (NAAQS) for three out of the six common air pollutants: fine particulate matter (PM2.5), ground-level ozone (the primary component of smog), and lead. Emissions of these pollutants stem from a wide range of sources and State plans for complying with the new standards will vary. Unfortunately, several areas, such as parts of California, remain grossly out of compliance with current NAAQS, and it will be difficult for some of them to reach compliance within the next couple of decades.

The President's 2002 Clear Skies Initiative called for using cost-effective, market-based policy instruments to dramatically reduce power plants' emissions of sulfur dioxide, nitrogen oxide, and mercury. Although Clear Skies legislation did not pass the Congress, in 2005 the EPA took a major step

toward a more efficient multipollutant policy in the electricity sector by finalizing two rules, the Clean Air Interstate Rule (CAIR) and the companion Clean Air Mercury Rule (CAMR), which echoed many features of the Clear Skies Initiative.

The Clean Air Interstate Rule (CAIR) received broad support from economists, environmental groups, states, policymakers, and the regulated industry for promoting significant environmental improvements at a lower cost to society than a traditional command and control type of regulation. CAIR was designed to provide states with a solution to the problem of pollution that crosses State boundaries. Covering 28 eastern States and the District of Columbia, the rule requires the steepest emissions cuts from coal-fired power plants required in over a decade implemented in two phases by 2015. When fully implemented, caps on annual NO_X and SO_2 emissions would permanently reduce NO_X and SO_2 from coal-fired power plants in the eastern United States by more than 60 percent and 70 percent, respectively, from 2003 levels. The rule is projected to achieve over $100 billion in net benefits by 2015 (see Table 3-1). In addition to the cost savings from using a more market-based approach, CAIR's cap-and-trade program has other beneficial effects. For example, the cap on NO_X would prevent any increases in aggregate NO_X emissions in the East that might otherwise arise from electricity sector restructuring.

In February 2008, the United States Court of Appeals ruled CAMR to be unlawful because the EPA had not taken the appropriate steps to regulate mercury emissions from power plants under a more flexible portion of the Clean Air Act (CAA) that allows for a cap-and-trade program. Then in July 2008, the Court ruled that the CAIR rule was fundamentally flawed, and it vacated the entire rule. The ruling was based on several issues, including that the cap-and-trade program was too focused on regionwide emission reductions and did not adequately factor in each State's significant contribution to air pollution issues. For example, the Court deemed that CAIR did not provide adequate protection for downwind areas. While both rulings have been appealed through the courts and contested and debated on many fronts, their invalidation would have substantial consequences because the underlying requirements of the Clean Air Act remain in place. For example, all States would have to redo their State Implementation Plans (SIPs) to demonstrate compliance with CAA requirements and would not be able to rely on the cost-effective controls built into CAIR. The thousands of premature deaths avoided annually and other significant health and environmental gains would come at a higher price, if at all, in the absence of a fix for these rules that retains their trading provisions. After receiving petitions from a range of industry groups, States, and the Administration, in December 2008 a Federal appeals court reversed the earlier decision on CAIR, allowing for the

Table 3-1—*Projected Net Benefits from Selected 2001-08 EPA Clean Air Regulations*

Rule Name	Year Enacted	Primary Pollutants Targeted*	Net Benefits in 2020** (billions of 2006 dollars)	
			3% Discounting	7% Discounting
Electricity Sector				
Clean Air Interstate Rule (CAIR)	2005	SO_2, NO_X Cobenefits: Mercury	$119.2	$100.7
Clean Air Mercury Rule (CAMR)	2005; Revised 2006	Mercury Cobenefits: PM	–$0.8 to –$0.7	—
Transportation Sector				
Nonroad Diesel Engines and Fuel	2004	NO_X, PM	$49.2	$48.0
Locomotive and Marine Diesel Engines	2008	NO_X, PM	$3.6 to $8.5	$3.3 to $7.7
Small Spark Ignition Engines and Equipment	2008	Hydrocarbon (HC) + NO_X, CO	$1.0 to $3.9	$0.9 to $3.7
Emission Sources in Multiple Sectors				
Clean Air Visibility Rule (CAVR)	2005	SO_2, NO_X	$2.7 to $14.5	$2.3 to $11.3
National Ambient Air Quality Standards (NAAQS)				
Particulate matter (PM2.5)	2006	PM2.5, SO_2, NOX	$4.2 to $84.7	$2.9 to $71.4
Ozone	2008	NO_X, VOC Cobenefits: PM	–$6.8 to $11	–$7.0 to $9.9
Lead	2008	Lead Cobenefits: PM	$0.9 to $6.8	–$2.6 to $2.4

*Lists pollutants whose reductions are monetized in the benefit calculations. There may be additional cobenefits resulting from reductions in other pollutants that are not quantified in the rulemaking analysis.
** The table shows net benefits expected in 2015 for CAIR and CAVR and 2016 for lead NAAQS.
Note: Consistent with OMB and EPA guidelines, net benefits are calculated using both a 3 percent and 7 percent discount rate for valuing future impacts (although net benefits using the 7 percent discount rate are not available from the revised 2006 CAMR analysis). Note that the assumptions and methods used in each of the Regulatory Impact Analyses (RIAs) are not necessarily consistent across the rules listed.
Source: Environmental Protection Agency (Regulatory Impact Analyses).

reinstatement of the rule until EPA crafts a replacement. This reversal helps to avoid a prolonged period of regulatory uncertainty that may result in the reduction or elimination of pollution-control construction projects.

Developing Cleaner Fossil Fuel Technology

In addition to regulating local and regional air pollutants, the Administration has promoted cleaner ways to use our domestic fossil fuels through the use of tax incentives. For example, EPACT broadened the scope of the investment tax credits (ITCs) for renewable energy production to apply to investments in certain clean coal facilities, such as Integrated Gasification Combined Cycle (IGCC) power plants, which rely on a two-stage process in which pollutants

are removed before combustion occurs. Recent research shows that the 20 percent ITC for new IGCC plants potentially could make this technology cost-competitive with new conventional coal plants. Because of their inherently higher operating efficiency, IGCC plants are estimated to produce up to 8 percent fewer CO_2 emissions per megawatt hour (mWh) than conventional coal plants. Furthermore, capturing and store the CO_2 emissions underground (known as carbon capture and sequestration, or CCS) would be less expensive in an IGCC plant than in a conventional power plant. Also, the IGCC process produces very low levels of common air pollutants (NO_X, SO_2, and PM) and volatile mercury, which reduces the cost of compliance with regulations of these emissions. To date, two 260–290 megawatt (mW) IGCC power plants are in operation in the United States and others are in the pipeline. A third, larger facility (with 630 mW capacity) received approval in January 2008.

Removing Regulatory Impediments to Domestic Production

Finally, the Administration has worked to remove regulatory impediments to bringing domestic energy sources, including fossil fuels, to market. In July 2008, the President lifted the Executive restriction on offshore exploration and requested that the Congress also lift its ban. On September 30, 2008, the ban on offshore domestic exploration of natural gas and oil was allowed to expire, a decision that would allow open access to an estimated 14 billion barrels of oil and nearly 55 trillion cubic feet of gas off the Atlantic and Pacific coasts. These previously restricted areas represent a sizable portion of the estimated 101 billion barrels of oil and 480 trillion cubic feet of natural gas untapped on the outer continental shelf. While we strive toward the long-term goal of reducing the economy's overall reliance on oil for environmental and security reasons, expanded domestic oil and gas production in these areas will help reduce the $300 billion Americans spend each year on net petroleum imports.

Overarching Challenges

Despite widespread support for increasing the use of market-oriented approaches to achieve our environmental and energy policy goals going forward, numerous challenges remain in realizing the full potential of these types of policies.

Balancing Local, Regional and Global Goals

First, any future comprehensive national energy policy will need to address potential tradeoffs between environmental and security goals, as well as tradeoffs between competing environmental goals. As noted earlier, policies aimed at mitigating local air pollution can at times reduce GHG and vice versa. For example, the clean diesel programs may provide climate change benefits by reducing black carbon (soot), the climate change effects of which require further study but many argue could be quite substantial. (The clean diesel rules will also likely become more significant if there is an increase in the number of diesel vehicles due to policies aimed at improving fuel economy and reducing GHG emissions from mobile sources.) However, some air quality policies may result in "technology lock-in" that could cause major delays in the implementation of GHG control technologies because of the investment in capital and other resources to meet the air quality control requirements. Policies aimed at GHG mitigation may also at times increase emissions of traditional pollutants. For example, technology standards that require increasing the thermal efficiency of engines may lead designers to achieve the regulatory objective by raising combustion temperatures, a strategy that would tend to increase NO_X emissions unless countered by other control methods. The challenge going forward will be to design comprehensive policies that enhance synergies and reduce the degree to which policies may work at odds with one another.

There are additional conflicts that will continue to arise in achieving long term environmental goals. For example, in the transition to alternative energy sources, where will new facilities and transmission infrastructure for different types of electricity generation be built? This issue is especially contentious when talking about new nuclear facilities, large scale CCS facilities, and renewable sources such as off-shore wind turbines. Renewable energy facilities generally face greater siting hurdles than their conventional counterparts because they can only be located at certain sites. The most highly valued renewable resources are often in pristine, isolated parts of the country (like mountain ridges, open plains, and coastal waters) with significant environmental and aesthetic value. Siting hurdles are compounded by the additional transmission and distribution infrastructure that is needed to bring the electricity from remote generation sites to population centers. States will have to balance renewable energy goals with other environmental concerns in deciding whether to support investment in new transmission infrastructure, such as new regional transmission corridors. Similarly, there are significant challenges that must be faced in expanding or reconfiguring existing fuel distribution systems to accommodate the large volumes of ethanol and other biofuels required by EISA.

Obstacles to increased nuclear power generation extend beyond the hurdles of siting power plants. There is also a concern about the lack of long-term storage for the spent fuel generated by nuclear plants. To reduce the amount of spent fuel that must be properly contained for centuries, efforts may also be made to increase recycling of this fuel within the generation process, but without producing weapons-grade material. The Administration has laid the groundwork for tackling this issue through efforts such as the Global Nuclear Energy Partnership (GNEP) and the Nuclear Power 2010 joint government–industry effort to develop advanced nuclear plant technology and reduce technical, regulatory, and institutional barriers to nuclear deployment.

Efficient R&D Support for Alternative Energy Sources

Technology policies will continue to be an important component of any energy policy portfolio going forward. Many economists maintain that, as a complement to any pricing policy directed at environmental problems, governments will need to support R&D for alternative energy sources. The challenge will be to ensure that any R&D support is managed efficiently and effectively.

As discussed above, an emission pricing policy is a key step in inducing technological change at low cost because the emissions price provides the private sector with a direct incentive to invest in and deploy new environment-friendly innovations. Well-targeted technology policy can reinforce these incentives for private R&D and thus reduce future costs. Basic and applied energy-related research as well as the education of the next generation of researchers will continue to be in particular need of government support, because these areas are the least likely to be undertaken by the private sector. It will also be crucial to expand the use of more flexible research policy instruments that allow the market, rather than government, to pick technology winners. For example, the Government could award prizes for basic research advancements in energy storage, which would help to spur innovation in a wide range of low-carbon technologies. Efforts are already underway to expand the use of prizes in some areas. EISA provided authorization for an L-prize for high-efficiency solid-state lighting products and an H-prize for advancements in hydrogen technology.

Current policies that target the adoption or deployment phase of the technological development process also need reviewing. Many of the existing tax credits have been found to be costly ways of making renewable sources competitive with fossil fuel sources. However, if technology deployment incentives are needed, they should be applied in a way that is neutral across all alternatives. Existing subsidies such as the ethanol blender's tax credit, flex-fuel vehicle credits, and subsidies for alternative electricity generation, in combination with the growing use of existing residential deductions and credits for energy-efficient home improvements, have created a patchwork

of incentives that send an inconsistent message about how much the abatement of a ton of carbon is worth. In addition, there are opportunity costs associated with resources devoted to any area of research or deployment support. For example, in the context of renewable fuels, additional support for first-generation biofuels such as corn ethanol reduces the amount of funding available for the development of other alternatives and could make it more difficult for second-generation biofuels (with potentially significantly lower GHG emissions) to become viable.

Going forward, it will be important to reform these subsidies so as to minimize market distortions. One way existing tax incentives could be simplified is to offer a single subsidy in which the payment is weighted by the extent to which petroleum consumption and/or carbon is reduced relative to a baseline technology. In April 2008, the President voiced strong support for such a reform of the current complicated mix of incentives to make the commercialization and use of new, lower emission technologies more competitive. Another policy instrument that could encourage commercial use of new energy-efficient technology at a lower cost to the taxpayer is the reverse auction, in which would-be subsidy recipients (such as a renewable energy project developer) submit proposals for new projects and bid the minimum price they would accept for zero- or low-carbon electricity generation. However, such technology adoption policies may still favor what are currently the least expensive technologies, rather than technologies that may have greater potential to reduce cost and improve environmental performance through learning by doing.

Economically Efficient Regulation Under Existing Statutes

Another significant challenge in realizing the full potential of market-oriented policy approaches is likely to be the ability of existing laws to address old and new environmental problems in more efficient ways.

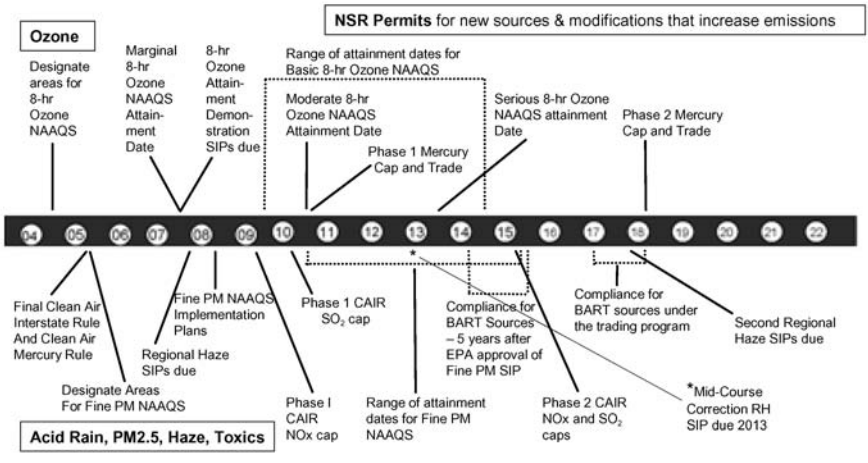
Local and Regional Air Pollutants

Although there have been great gains in reducing common air pollutants under the Clean Air Act, air pollution will continue to be a problem in the future, and the importance of finding economically efficient ways to further improve air quality will only increase. As seen in the 2008 National Ambient Air Quality Standard (NAAQS) for ozone, stricter standards have moved the private sector up the marginal cost-of-control curve. That is, it is becoming more costly to reduce each additional ton of NO_X and VOC emissions (the precursors to ground-level ozone). Upcoming reviews of the NAAQS for other pollutants will undoubtedly reveal a similar trend. These trends do not shed light on the relative cost of controlling one pollutant over others,

due to the sequential nature of the individual NAAQS reviews. However, it is likely to spark debate about the benefits of moving either toward a more integrated multipollutant approach to controlling emissions of pollutants that pose the most significant risks or toward a more goal-oriented standard setting, as there may be no level that adequately protects human health and the environment for some pollutants (for example, lead), and currently costs cannot be considered in setting a NAAQS.

A multipollutant approach can help reduce the costs of meeting standards in regulated industries, such as the electricity sector, in which power plants face an increasingly complex set of requirements under the current Clean Air Act (CAA) (see Chart 3-4). The President's Clear Skies Initiative was an important first step in establishing a multipollutant approach. It is important that the market-oriented aspects of the CAIR and CAMR rules not be lost upon being remanded to the EPA for revision. The Administration has also made efforts to reform the complex requirements for upgrading or building new power plants under the New Source Review provisions of the Clean Air Act. Such age differentiated regulations can create a disincentive to invest in energy efficiency improvements, thus slowing turnover in the capital stock (equipment and facilities) and pollution abatement. The debate over how best to reduce such counterproductive incentives will undoubtedly continue in the future.

Chart 3-4 **Clean Air Act Requirements for New Electric Generating Units, 2004–2022**
Power plants face a complex set of requirements under the current Clean Air Act.



Note: The timeline was developed in May 2005 and reflects EPA assumptions about rulemakings that had not been completed at that time. EPA's rulemakings are conducted through the usual notice-and-comment process, and the conclusions may vary from these assumptions.
Source: Environmental Protection Agency.

Greenhouse Gas Emissions

Existing statutes are not well suited to tackling problems that were not considered when the original laws were written. In the context of climate change, the unique characteristics of GHGs and the ubiquity of GHG emission sources present significant challenges for economically efficient regulatory design under the existing Clean Air Act or other statutes. Unlike most traditional air pollutants, GHG emissions become well mixed throughout the global atmosphere, so a unit of GHG emissions has the same effect on environmental quality regardless of where it comes from, and, once emitted, GHGs can remain in the atmosphere for decades to centuries. Therefore, while policies can control the flow of GHG emissions, the ultimate concern is the stock—the cumulative concentration of GHGs in the atmosphere. These characteristics suggest that GHGs are particularly well suited to market-oriented policies that do not dictate the exact location and timing of emission reductions as opposed to the command and control type of regulation under the CAA that is used for some other pollutants.

There are examples of CAA regulations in which market-oriented approaches have been used for groups of mobile or stationary sources, such as in the Acid Rain Control Program, and even some cases in which multi-sector trading programs have been established. However, economists have demonstrated that taking a more integrated approach to control GHGs, such as through a common cap or price on emissions across sectors, would allow the market to identify a combination of methods to reduce the cost of achieving a given emission reduction. For example, expanding the coverage of such a market-oriented policy to include the industrial, electricity, and transportation sectors has been found to substantially decrease the cost of achieving a given emission reduction compared to one that is limited to the electricity and transportation sectors. However, if a policymaker's goal is to transform technology in a single area to the point where developing countries would voluntarily adopt the new low-carbon technology, then the advantage of a sector-specific approach is that it may help to ensure that technology investment remains within that sector.

It is unclear whether it would be legally possible to implement an economy-wide system for GHGs under the CAA. However, any economy-wide program under one provision of the CAA would likely trigger additional source-specific or sector-based requirements as a result of other CAA provisions, thus resulting in multiple programs affecting a particular sector, source category, or GHG. With multiple market-oriented policies focused on the same problem, the overall emissions reductions may not be achieved in the least costly way because there would not be a common price of pollution across all activities that directly result in GHG emissions. Without such a common price, full trading opportunities to reduce control costs will not be

realized. In addition, emissions leakage across sectors and countries can occur when the cost of reducing one ton of emissions differs across them. When faced with a high cost of complying with new environmental regulations, a firm may move its operations to a jurisdiction with less stringent (and less costly) emissions controls. Current requirements under the CAA do not consider the actions (or inaction) of other countries or allow for consideration of unequal treatment of emissions across different types of emitters.

The Clean Air Act is also not designed to implement any carbon-pricing policy so that it operates in an efficient and transparent manner. For example, economists suggest that it would be economically efficient to employ a broad-based emissions tax, using the proceeds to decrease distortionary taxes. A well designed cap-and-trade system can have much in common with a well designed tax, but policy considerations should weigh heavily on how emissions allowances would be distributed under such a program. The economic literature broadly finds that there are significant efficiency advantages to auctioning emissions allowances, particularly if the revenues are used for reducing existing distortionary taxes. Also, cost-containment provisions in a cap-and-trade program, such as a safety valve allowance price, help to prevent caps from resulting in allowance prices that are higher than the social cost of the emissions. However, the CAA does not authorize the EPA to impose taxes or to administer a broad cap-and-trade program with auctioning and cost-containment provisions, making the Act ill suited to address the unique challenges posed by GHG emissions.

The globalized nature of GHG emissions is also likely to create difficulties in other statutes, such as the Endangered Species Act (ESA) and the National Environmental Policy Act (NEPA), which were designed to address local or regional concerns. For example, the ESA requires consultation between Federal agencies when a Federal action is likely to cause effects that pose a threat to a listed species. However, because the effects of GHG emissions have global repercussions, any causal connection between the effects of any particular action and the loss of a listed animal or its habitat is not discernible, or at least not significant or proximate enough to warrant such consultation. Similarly, the types of environmental impacts included in NEPA analyses are local or regional in nature and do not fit into the complexities related to global climate change effects.

Given the difficulties in applying existing statutes to the unique problems presented by GHGs, policymakers should seek new approaches for enacting comprehensive and market-oriented solutions. The scientific debate over the specific GHG concentrations needed to affect global temperatures and the probability of catastrophic damages will continue for some time, and the policy debate over tough questions such as to how to value future emissions reductions is far from settled. In the face of such uncertainty and discussion

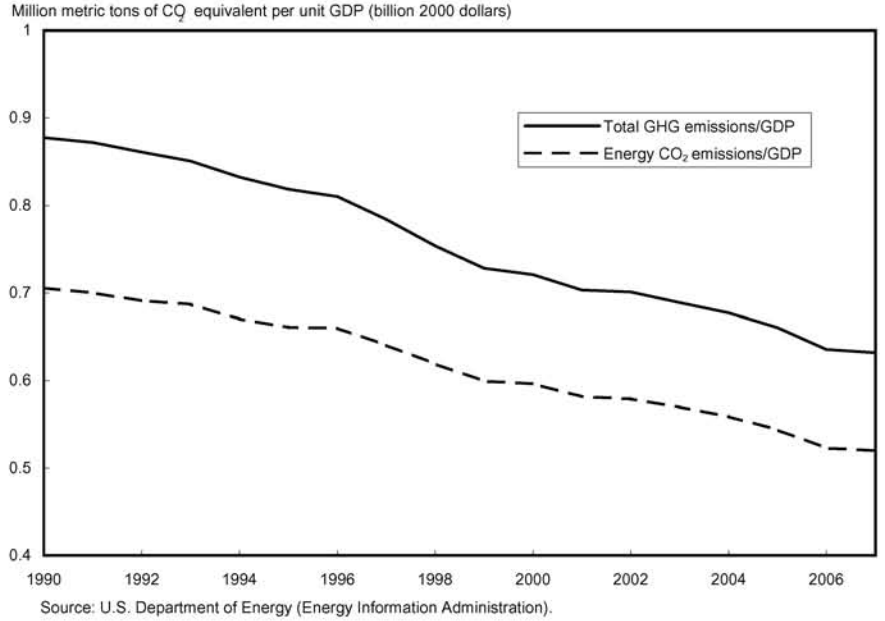
of numerous other policy design issues, flexibility and transparency will be vital to the success of any policy designed to address global climate change.

Global Action on Climate Change

Finally, perhaps the most significant challenge in tackling climate change is developing broad-based global action to make meaningful progress in reducing GHG emissions.

As shown in Chart 3-5, U.S. greenhouse gas intensity (as measured by GHG emissions per unit of GDP) has been improving over time. In 2002, the President set a goal of reducing U.S. GHG intensity by 18 percent by 2012, and the Nation is on track to meet and exceed this target. Between 2002 and 2007, both energy-related CO_2 emissions per unit of GDP and total GHG emissions per unit of GDP declined by about 10 percent. In the spring of 2008, the President also set a new goal to stop U.S. growth in total GHG emissions by 2025. Despite U.S. action toward meeting these or future domestic GHG reduction targets, it is important to understand that U.S. action alone will not reverse global emission growth or stabilize global atmospheric GHG concentrations. Many assert that it is the responsibility of developed countries to reduce GHG emissions, since they have a longer historical record of emissions and therefore are responsible for most of the existing atmospheric concentrations. This formulation does not account for the reduction in the

Chart 3-5 **Greenhouse Gas Intensity of U.S. Economy, 1990–2007**
The greenhouse gas intensity of the U.S. economy has improved dramatically over time

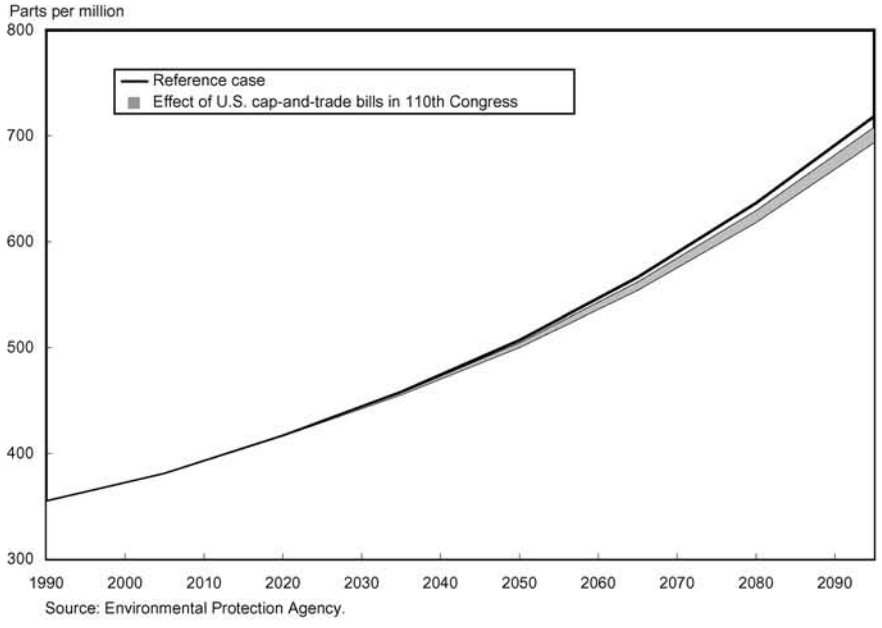


Source: U.S. Department of Energy (Energy Information Administration).

natural absorption of CO_2 (for example, in forests) due to land-use change that has occurred throughout the world. More important, actions by developed countries alone will not stabilize atmospheric concentrations given the recent and projected emissions growth in large rapidly developing economies.

Chart 3-6 provides one example of why it is important for all countries, particularly major economies involved in negotiations, to limit GHG emissions. The chart shows the future path of global CO_2 concentrations if the United States takes action to reduce GHG emissions under various cap-and-trade bills recently debated in Congress. One of the main reasons why future global concentrations do not decrease substantially compared to the reference case (which is a business-as-usual case that includes current international efforts to address climate change) is that major emerging economies represent a large and growing share of global GHG emissions. In addition, international emissions leakage may reduce global mitigation if only a handful of countries take action. Just as sector-based regulation of GHG emissions under the CAA raises worry about potential leakage of emissions across source categories, there are concerns about potential shifts in GHG emissions to countries where GHGs face no regulations. Energy-intensive industries in which domestic firms would face significantly higher costs due to regulation may move operations to unregulated foreign markets where costs are lower. International sectoral agreements in energy-intensive industries can help alleviate some of these competitiveness concerns.

Chart 3-6 **Global CO_2 Concentrations**
Carbon emissions are projected to rise over the next several decades.



Source: Environmental Protection Agency.

It is clear from the projections above, as well as other recent analyses of climate mitigation scenarios, that climate change requires a global solution, with participation by all major economies. The Administration has recently taken several steps to encourage wider international action to address GHGs, including promoting consensus toward commitments in developing countries. In 2007, the Administration launched the Major Economies Meeting (MEM) process, involving those of the world's major economies that use the most energy and emit the most GHGs, to help promote international action to slow, stop, and eventually reverse the growth of GHGs. This process is intended to support the United Nations Framework Convention on Climate Change (UNFCCC) negotiations by elaborating on areas of shared understanding among the major GHG emitters. At the July 2008 MEM meeting in Japan, leaders issued a Leaders Declaration that emphasizes "ambitious, realistic, and achievable" steps toward achieving these goals and agreement to take near-term actions. Leaders agreed to continue to work together to promote the success of the negotiations under the UNFCCC.

In addition to achieving commitments by all major economies, accelerating the deployment of clean energy technology in emerging economies is critical to mitigating climate change. To this end, the United States has taken several steps to form international partnerships to support national climate change efforts. In 2007, the Administration led efforts to produce an international agreement to accelerate the phase-out of the hydrochlorofluorocarbon (HCFC) refrigerants—a potent GHG—under the Montreal Protocol on Substances that Deplete the Ozone Layer. Under this agreement, both developed and developing countries explicitly agreed to accept binding and enforceable commitments that have climate change benefits. In 2008, the President launched the Clean Technology Fund to help bridge the gap between current technology and cleaner, more efficient ways of fueling the world's growth. The President has asked Congress for an initial U.S. commitment of $2 billion, and many other nations have pledge support. Altogether, the United States, the United Kingdom, Japan, France, Germany, Sweden, Australia, and Spain have pledged over $5 billion to the Fund, which will be housed at and overseen by the World Bank.

To be eligible for funding, a project must be consistent with the recipient country's national low-carbon growth strategy and must help move the relevant industry or sector toward a clean-energy path. Competition is intended to be technology-neutral, with projects competing for financing based on lifetime GHG reductions compared to the baseline technology and relative to the Fund's investment. The recipient country would contribute public and/or private capital to meet the project's baseline costs. The Clean Technology Fund would help finance the cost difference between the clean energy technology and the standard baseline, higher-emissions technology.

In partnership with the European Union, the United States also proposed the Environmental Goods and Services Agreement in the World Trade Organization (WTO) to eliminate tariff and non-tariff barriers to environmental technologies and services. This proposal included an agreement in the WTO to eliminate tariffs worldwide on 43 climate-friendly technologies identified by the World Bank. It also included a higher level of commitment from developed and most advanced developing countries to eliminate trade barriers across a broader range of goods and services. Global trade in the environmental goods covered by the proposal totaled approximately $613 billion in 2006, and global exports of these goods have grown annually by an average of 15 percent since 2000. The World Bank suggests that by removing trade barriers on key technologies, trade could increase by an additional 7 to 14 percent annually.

Other international partnerships to pursue development and diffusion of clean energy include the 21-member Global Nuclear Energy Partnership (GNEP) and the 7-country Asia-Pacific Partnership on Clean Development and Climate (APP). These are primarily sectoral efforts to support national climate change efforts. The GNEP, announced by the President in 2006, focuses on promoting technology breakthroughs to support the long-term expansion of clean, safe, proliferation-resistant nuclear power here and abroad. As mentioned earlier, safer ways to deal with storage of nuclear waste are crucial to this effort. The APP has a somewhat broader mission. It aims to promote coordination among different sectors to create new investment opportunities, build local capacity, and remove barriers to the introduction of a wide range of cleaner, more efficient technologies.

Conclusion

Energy policy will continue to be one of the major challenges facing the United States for many years to come. As the Federal Government moves toward a more integrated approach in confronting energy security, climate change, and other environmental challenges, we will need to ensure that we consider the economic efficiency of future laws and regulations. In addition to advancing clean and renewable energy technologies, a key challenge going forward will be leading all countries to work cooperatively to achieve global climate goals with meaningful participation by all major economies.

CHAPTER 4

The Benefits of Open Trade and Investment Policies

An open economy is characterized by receptiveness to foreign ideas, technology, products, services, and investment. The United States has one of the most open economies in the world, ranking very high in common measures of openness to trade and investment. As a large and diverse economy, the United States engages in more trade and investment than any other country in dollar terms, and it also has, on average, very low barriers to cross-border flows of goods, services, and capital.

In the long run, open economic policies generate many benefits. Trade and investment linkages with other countries increase competition in domestic industries; enhance the purchasing power of consumers; provide exposure to new products, services, and ideas from abroad; and give domestic firms wider markets in which to sell goods and services. In the short run, the interdependence among open economies generally provides benefits—open economies may rely on foreign borrowing or foreign demand for domestically produced exports to cushion an economic downturn—but may also create visible costs that obscure these benefits, as when foreign investment shifts abruptly out of certain sectors or when foreign demand for domestic exports falls. Nevertheless, any potential negative effects from our openness to trade and investment do not outweigh the enormous gains society has realized over decades from this openness.

This chapter begins with a discussion of key facts about trade and investment in the United States, followed by a discussion of the benefits of free trade and open investment, and the policies that the United States has taken to enhance both. These policies include an increased number of free trade agreements (FTAs) and the strong commitment of the United States to maintain openness to foreign direct investment (FDI) while still addressing legitimate national security concerns. The chapter continues with a discussion of international development assistance, and concludes with a review of issues that could affect future U.S. trade policy. The key points of this chapter are:

- Openness to trade and investment has boosted U.S. economic growth. Openness can also reduce the impact of shocks and increase the resilience of the U.S. economy.
- The number of U.S. FTAs has increased greatly during this Administration, and these agreements have contributed to the growth in U.S. exports.

- Portfolio and direct investment into the United States reached historic levels over the past decade, in part due to the depth, diversity, and openness of U.S. financial markets and the competitiveness of U.S. firms.
- The United States has maintained an open investment policy, facilitating FDI flows between the United States and the world while addressing legitimate national security concerns.
- U.S. development and trade initiatives, as well as U.S. engagement in multilateral institutions such as the World Trade Organization and the World Bank have helped increase growth and foster political and economic stability in developing countries throughout the world.
- Continued commitment to open economic policies throughout the world will help ensure continued economic gains for the United States and the rest of the world.

Trade and Investment in the United States

Trade in goods and services has played an increased role in the U.S. economy over the past decade. As seen in Table 4-1, in the first half of 2008, the United States exported goods and services equivalent to 13.0 percent of Gross Domestic Product (GDP), and imported goods and services equal to 18.1 percent of GDP. These figures are the highest on record, considerably above figures from 2000, when exports were equal to 10.9 percent, and imports 14.8 percent, of GDP. The *current account,* which measures the net value of the flow of current international transactions, is chiefly composed of the difference between exports and imports. The U.S. current account deficit widened over this period from 4.1 percent of GDP in the first quarter of 2000 to a peak of 6.6 percent of GDP in the final quarter of 2005. The current account deficit then narrowed to 4.8 percent of GDP at the end of 2007 before expanding slightly over the first half of 2008.

Table 4-1.—*U.S. Trade and Investment*

	2007 value (billion dollars)	Share of U.S. GDP (percent)		
		2000	2007	2008 Q1–Q2
Current account balance, (-) = deficit	**–731**	**–4.3**	**–5.3**	**–5.0**
Exports of goods and services	1,646	10.9	11.9	13.0
Imports of goods and services	2,346	14.8	17.0	18.1
Other	–31	–0.4	–0.2	0.0
Net capital inflows into the U.S.	**768**	**4.9**	**5.6**	**4.7**
Net inflows for foreign investments in the U.S.	2,058	10.6	14.9	6.8
Net outflows for U.S. investments abroad	1,290	5.7	9.3	2.1

Source: Department of Commerce (Bureau of Economic Analysis).

As a matter of accounting, the current account deficit is mirrored by net inflows of capital into the United States, which have provided the financing that has allowed us to purchase more in imports than we sell in exports. From Table 4-1, we can see that net capital inflows into the United States were equal to 4.7 percent of GDP in the first half of 2008, a figure that approximately matches the current account deficit, with a discrepancy caused by measurement errors, omissions, and the exclusion of certain types of capital flows for which only partial data are available. The increase in net capital inflows looks modest compared with the huge increase in capital inflows to and outflows from the United States from 2000 to 2007, although the data for 2008 imply a sharp decline to levels lower than those of 2000 as a percentage of GDP.

Openness to Trade and Investment Has Substantially Contributed to U.S. Growth

Many studies have shown that greater openness to trade and investment is associated with faster growth in the long run. There are many ways to measure openness, including by looking at both the extent of trade and investment and the size of barriers to these flows. By either measure, countries that increased openness have grown faster and have had greater increases in living standards than countries that have remained less open. Research has not yet conclusively determined the incremental gain in income that a country receives from a specific increase in trade because the exact change can depend on particular policies and circumstances.

In the current U.S. downturn that began at the end of 2007, trade has improved the resiliency of the U.S. economy. Strong global demand for U.S. goods and services in 2007 and the first half of 2008 boosted U.S. GDP growth in this period. As the trade deficit declined, the improvement in net exports (exports minus imports) became a sizeable contributor to U.S. growth in this period. Chart 4-1 shows real GDP growth and the contribution of net exports to that growth since 2001. Net exports have accounted for over half of real GDP growth in the past 2 years. Some of the recent U.S. strength in net exports has likely been driven by the depreciation of the dollar. The value of the dollar declined fairly steadily from its peak in 2002 to the summer of 2008, when it reached a level last seen in the mid-1990s. The depreciated dollar contributed to the increase in exports and the decline in real imports. In the second half of 2008, however, the value of the dollar increased, in part reflecting increased international demand for U.S. Treasury bonds in a time of global turmoil and rapidly deteriorating global growth.

The deteriorating performance of foreign economies in the second half of 2008 has recently reduced demand for U.S. exports. In the most recent U.S. data through October, both imports and exports have begun to decline, as they did during the global slowdown of 2001–02. The decline in exports will

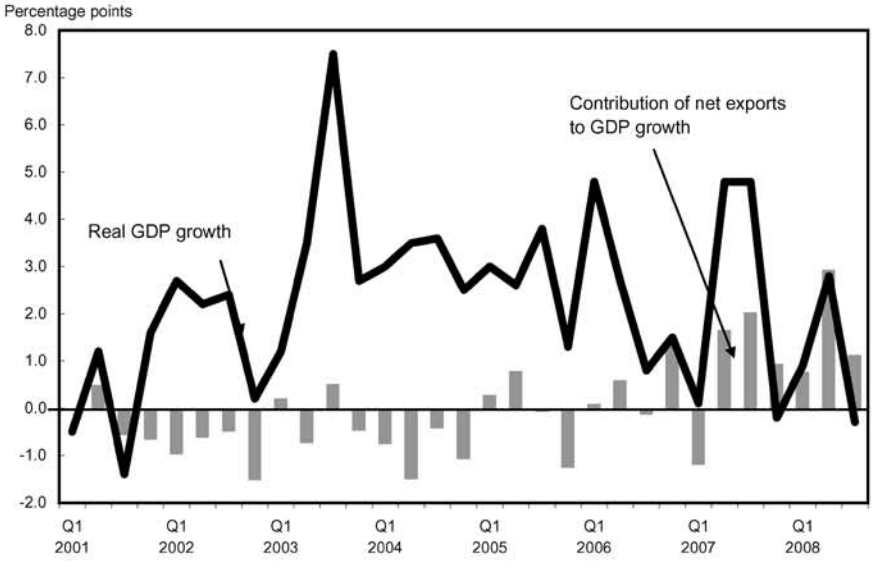
likely reduce the contribution of trade to GDP growth in the short term, and net exports may provide no boost to growth in the fourth quarter of 2008. Trade may still hold up better than other components of GDP, however, as consumption and investment are expected to decline enough to make overall GDP growth negative in the short term (see the discussion of the near-term macroeconomic environment in Chapter 1).

Strong global demand for goods drove up prices of a broad range of commodities through the middle of 2008, but global weakness in the second half of the year has reversed most of these gains. This is good news for users, both consumers and producers, but raises some concerns for the exporters that had benefited from the higher prices. However, the broad-based decline in prices of oil, food, and agricultural commodities has considerably eased earlier fears of inflation.

The Benefits of Free Trade

Free trade contributes to economic prosperity in many ways. One of the greatest benefits of trade is that international differences in prices allow countries to utilize their *comparative advantage,* because trade gives a country access to goods and services at relatively low prices, while simultaneously

Chart 4-1 **Contribution of Net Exports to Real U.S. GDP Growth**
Net exports have accounted for more than half of U.S. growth in the last two years.



Source: Department of Commerce (Bureau of Economic Analysis).

allowing domestic producers to find profitable export markets in which to sell goods that can be produced at lower prices at home than abroad. Trade allows a nation to achieve higher overall consumption of goods and services than would be possible if no trade occurred. Trade also benefits consumers by increasing the number and variety of goods available domestically.

Trade raises the productivity of domestic firms in multiple ways: (1) Trade shifts production toward goods in which the country has a comparative advantage, so that over time, capital and labor will become concentrated in relatively more productive sectors, raising national income; (2) trade connects domestic producers to new technology and a greater variety of inputs, and it exposes them to more competition; and (3) firms that gain access to new markets can increase average productivity as unit costs fall, thus benefiting from what economists call *economies of scale* in production. Because trade allows the most productive firms and sectors to increase their share of U.S. production, trade makes possible increases in productivity, profitability, and wages that raise national standards of living.

Firms engaged in export trade provide important benefits to the economy. Exporting firms are a large engine of growth and employment in the U.S. economy. In 2006, 20 percent of manufacturing jobs were generated directly or indirectly by exports. Not only do exporters play a major role in job creation, but on average, productivity per worker is up to one-quarter higher in exporting firms than in nonexporters, and exporters pay each worker 13–18 percent more. Some of this exceptional performance occurs because exporters tend to concentrate in productive industries, but exporters also have higher productivity and higher wages than nonexporting firms in the *same* sector.

Among exporting firms, multinational enterprises, which own and control business operations in more than one county, account for an important share of U.S. trade and productivity growth. In the United States, U.S.-owned multinationals account for over one-half of total exports, and over 90 percent of U.S. exports to manufacturing affiliates were inputs for further processing. The extent of trade in intermediate inputs is an indication that trade is part of an increasingly complex chain, and companies have substantially improved productivity through the development of these global supply chains. Research shows that multinationals in the United States, both U.S.-owned and U.S. affiliates of foreign companies, were responsible for more than half of the increase in U.S. nonfarm labor productivity between 1977 and 2000.

Trade, while broadly beneficial, does not reward all people equally, and changes in trade can negatively affect some workers. In some cases, workers can receive lower wages when trade liberalization reduces the price of goods and services that they produce, and workers can lose jobs when imports reduce domestic production or jobs are relocated overseas. Over time, however, increased trade has made the United States more productive and has contributed to large increases in the U.S. standard of living. Estimates

of the gains to the United States from the postwar increase in global trade and the reduction in global trade barriers range up to $1 trillion dollars per year, or about $10,000 per household. In other cases, the use of global supply chains has led to the displacement of some U.S. workers, but as noted above, multinational companies generate considerable benefits for U.S. workers, generating high-wage jobs, substantial employment, and considerable improvements to U.S. productivity.

Although some jobs are lost due to trade, there are many other reasons for job loss in the United States, such as technological change and domestic competition. The United States has several programs to help workers adjust to displacements caused by trade. Chief among these programs is Trade Adjustment Assistance (see Box 8-2 in Chapter 8), which provides benefits and training to workers whose jobs are affected by trade and promotes their rapid reemployment.

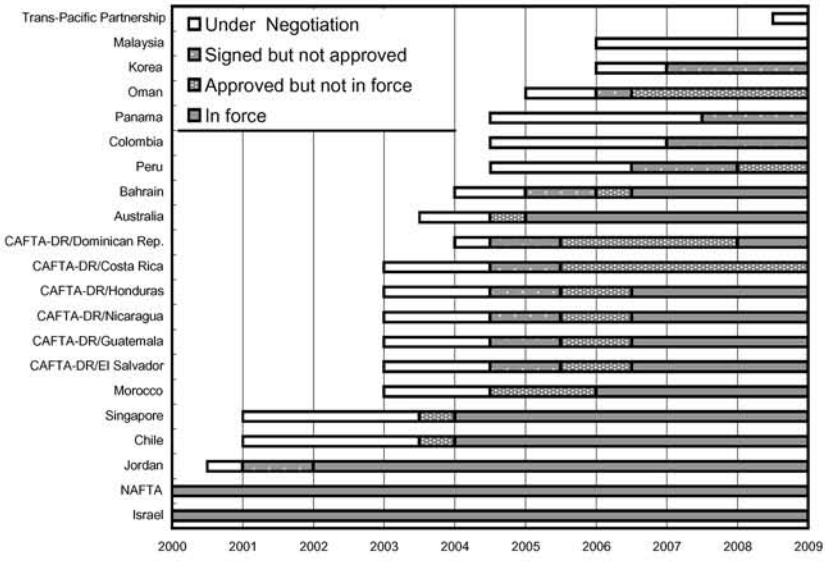
Free Trade Agreements

Trade policy is an important determinant of a country's openness to trade, and hence of its growth. In the past 8 years, U.S. policy has supported engagement in global free trade, which has been most evident in the increase in the number of U.S. free trade agreements (FTAs). FTAs are agreements that eliminate tariffs on substantially all trade between two or more countries; U.S. FTAs also reduce other barriers, such as restrictions on services trade and investment. Before 2001, the United States had implemented FTAs with three countries. To date, the United States has concluded FTAs with 20 countries, including 16 in force, one approved by Congress but not yet in force, and three concluded but not yet approved by Congress. The United States has concluded FTAs with trading partners on five continents and with three of our top 10 trading partners. In addition, the United States is currently negotiating FTAs with Malaysia and the members of the Trans-Pacific Strategic Economic Partnership. Chart 4-2 illustrates the progress of U.S. FTAs since 2000, from negotiation to the President's signature to enactment by Congress to being fully in force.

FTAs can dramatically increase trade. U.S. exports to countries whose FTAs came into force during this Administration increased 61 percent from 2000 to 2007, while U.S. imports from these countries increased 26 percent. Recent research shows that, on average worldwide, FTAs increase trade among member countries by about a third after 5 years and more than double trade after 15 years. Because many U.S. FTAs have been in force for less than 5 years, the experience of other countries suggests that these FTAs may continue to expand trade for another decade.

Increased duty-free trade has substantially reduced costs to U.S. importers and exporters and also lowered prices for U.S. consumers. In 2007, 41 percent

Chart 4-2 **U.S. FTA Progress, 2000-2009**
The number of FTAs at all stages in the process has increased since 2000.



Note: U.S. FTAs with Costa Rica and Oman entered into force on January 1, 2009.
Source: Office of the United States Trade Representative.

of U.S. exports went to FTA partners, and over 98 percent of U.S. products were eligible to enter these foreign markets duty free. In the same year, 31 percent of U.S. imports came from FTA partners, and 95 percent of these imports entered the United States duty free. The reduction in tariffs and quantitative limits, such as quotas, on goods trade in FTAs provides important benefits. Countries gain over time when they liberalize their own market, because capital and labor relocate to sectors in which they will be used more efficiently. Countries also gain immediately when FTA partners liberalize, because this liberalization lowers trade costs and improves the competitive position of exporters.

The size of initial foreign trade barriers is an important determinant of potential export gains from FTAs. One reason that U.S. exports to recent FTA partners increased more than imports from them did, is that in most cases, prior to these agreements, foreign tariffs were higher than U.S. tariffs. Many of these countries apply relatively high tariffs to imports from non-FTA partners, so U.S. FTAs considerably reduced costs to U.S. exporters and improved their competitive position. In contrast, goods from these countries were often already eligible to enter the United States duty free. Several FTA partners also had prior preferential access to the U.S. market under programs such as the Andean Trade Preferences Act and the Generalized System of Preferences, which are discussed in the development assistance section below.

U.S. FTAs also contain many beneficial nontariff provisions; particularly important are investment and services liberalization. Because of investment provisions in U.S. FTAs, U.S. companies that operate abroad benefit from more transparent and less burdensome regulation and greater certainty for investors. Developing countries can benefit from an improved legal framework at home and from the stability of permanent preferential access to U.S. markets, which can make the countries more attractive to international investment in all sectors. Liberalization of foreign services markets can improve access to the telecommunications, financial services, professional services, and other sectors. This access can generate large trade and welfare gains because of the high barriers to services trade in many countries.

Reducing barriers to investment and services can have large effects on trade and even greater effects on economic welfare than tariff liberalization does. FTAs have dramatically increased trade in some sectors with preexisting low, or even zero, tariff rates, demonstrating the positive effects of nontariff liberalizations. International data on barriers to services trade and investment flows are less precise than data on goods trade, so estimates vary, but recent research on U.S. FTAs shows that increased investment and reductions in services barriers can each provide more than twice the gains in purchasing power than can tariff liberalizations alone.

Quantifying the gains from FTAs is difficult because of the many uncertainties involved in estimating the effects that these agreements have on trade flows and on the behavior of producers and consumers, and because data limitations make some benefits currently unquantifiable. One series of reports that has focused on only the gains from tariff liberalizations under all U.S. FTAs finds that U.S. consumers gain about $22 billion in increased purchasing power annually. Other studies, though necessarily more speculative, have also included the gains from greater economies of scale, more product variety, long-run gains from capital accumulation, and reduced services barriers. These studies suggest that cumulatively, U.S. FTAs, both those in force and those pending, could increase U.S. purchasing power by about $150 billion, equivalent to about $1,300 per U.S. household, annually.

Reductions in Tariffs

The United States has one of the lowest average tariff rates in the world. U.S. average tariff rates have been steadily decreasing as duty-free imports from FTA partners have increased in the past decade. The trade-weighted average tariff rate, which gives each of over 11,000 tariff rates a weight equal to the value of U.S. imports in that sector, has been below 2 percent since 1999, and has now fallen below 1.4 percent. Trade-weighted averages can be misleading, however. Because high tariffs reduce trade, sectors with high tariffs are counted less when weighting by trade. The restrictiveness of U.S.

tariffs is better measured by calculating a single, "uniform" tariff that would produce the same volume of trade (or the same purchasing power for U.S. consumers) if applied to all sectors. Recent estimates of such a uniform tariff have been near 5 to 6 percent for the United States. This higher value captures a number of relatively high U.S. tariffs, particularly in agriculture, that are not well represented by the average rate.

The U.S. "uniform" tariff rate of 5 to 6 percent is lower than comparable estimates of tariff protection in major U.S. trading partners, both developing and developed. As in the United States, agricultural tariffs are a major source of other countries' high rates of protection. Because high agricultural protection is a global concern, efforts to reduce it are best negotiated in multilateral institutions such as the World Trade Organization (WTO), which is currently negotiating the Doha Round of trade liberalizations (initiated in Doha, Qatar). The United States and numerous other countries have proposed ambitious reductions in both agricultural tariffs and trade-distorting agricultural subsidies (see Box 4-1) that are critical to a successful market-opening outcome of the Doha Round.

Box 4-1: Farm Subsidies

Government payments to the farm sector have been part of U.S. farm policy since the 1930s, with the goal of increasing the standard of living of American farmers. Although they benefit some farmers, government payments can induce economically wasteful overproduction by encouraging production of higher-cost goods that would be unprofitable without subsidies. Thus, subsidies can generate costs to taxpayers that exceed the benefits received by U.S. producers and consumers. Due to the rise of large commercial farms, subsidies have also become increasingly directed toward high-income farmers. In 2006, farm households with an income over $100,000 received the majority of government payments (compared with the median U.S. household income of approximately $48,000). In addition to monetary costs, farm subsidies can also raise other concerns. Some subsidies require that land be reserved for specific crops, potentially limiting the variety of foodstuffs in local communities, and subsidy-induced production may raise fertilizer use, which contributes to environmentally damaging runoff.

Despite the fact that farm income in the United States is forecast to reach record levels in 2008, taxpayers will provide a projected $13 billion in payments to U.S. farmers this year. In real terms, direct government payments have come down by over half since 2000, when they were the highest ever, even exceeding payments during the farm debt crisis

continued on the next page

Box 4-1 — continued

of the 1980s. This decline was driven primarily by higher market prices for agricultural commodities, rather than by policy initiatives to reduce support. For example, government payments under several programs that provide support when commodity prices drop below a threshold level have declined over 80 percent since 2005, while farm bills, such as the Food, Conservation, and Energy Act of 2008, continue most existing support programs.

Agricultural subsidies are widespread in developed countries, although they represent a lower share of gross farm receipts in the United States than in the EU and in many other countries, including Japan, Korea, and Canada. Because subsidies can impose greater costs than benefits, reducing subsidies would increase incomes and economic welfare; indeed, research suggests eliminating agricultural subsidies in developed countries would increase U.S. welfare by several billion dollars per year. In developing countries, reducing subsidies would raise agricultural prices and improve the lives of producers, although it could also raise the cost of some food for consumers. Given the prevalence of agricultural support, multilateral agreements are the single most effective way to address this issue. The Doha Round of the WTO trade talks has included negotiations on limiting subsidies with the greatest potential to stimulate overproduction and distort trade. In July 2008, as part of the Doha talks, the U.S. Trade Representative announced that the United States was prepared to limit this subset of subsidies to $15 billion annually, down from the $22 billion limit offered in 2005. In the United States, these subsidies have exceeded the proposed new $15 billion limit in seven of the last 10 years.

The Benefits of Open Investment

The ability to either export excess savings in return for foreign assets or to borrow savings and invest more than is saved within the country can allow nations both to achieve higher income growth than would otherwise be possible and to cushion temporary shocks to the economy. Over time, the United States has benefited in both ways. For example, foreign demand for secure investments has lowered borrowing costs for the U.S. Government. There have also been benefits from accumulating assets overseas: U.S. businesses and investors have been able to make use of their foreign asset holdings to diversify, reduce risk, and raise overall returns on investments.

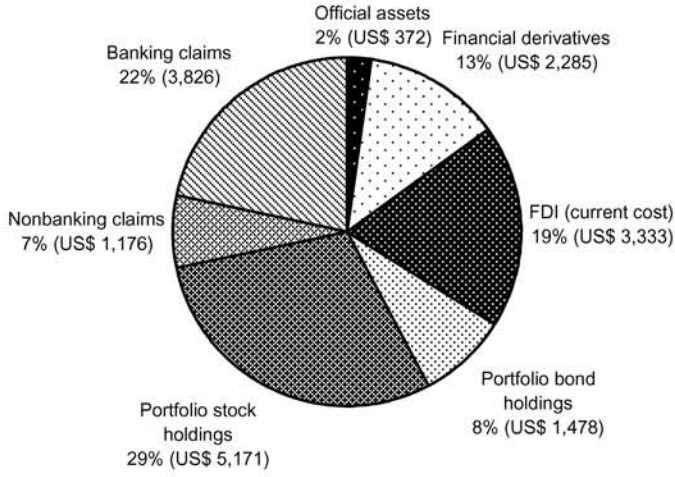
Economic growth has likely been supported by openness to foreign investment in a variety of ways, including an increase in the amount of

capital available for investment; greater transfer of technology; increased employment; and greater access to global capital, goods, and services by domestic firms. Although still a matter of debate among economists, foreign direct investment is generally considered to convey all of these benefits in a particularly straightforward fashion. According to the latest data available from the Commerce Department, in 2006, U.S. affiliates of foreign companies accounted for 6.1 percent of U.S. nonbank private sector production, provided more than 5.3 million jobs to American workers (4.6 percent of the U.S. workforce), spent $34.3 billion on research and development (14 percent of U.S. expenditure on R&D), and accounted for 19 percent of U.S. exports.

The benefits that a country receives are related to the volume and composition of its investment flows. The net flow of investment across borders is equal to the gap between the value of goods and services that a nation exports and the value of the goods and services it imports. This is also equal to the difference between a nation's savings and its domestic investment. Nations that save more than they invest domestically invest these extra savings in the rest of the world, and in the process purchase foreign assets, including bonds, equities, and FDI. Nations whose domestic investment exceeds their savings receive investments from abroad and, in doing so, sell assets to foreign residents.

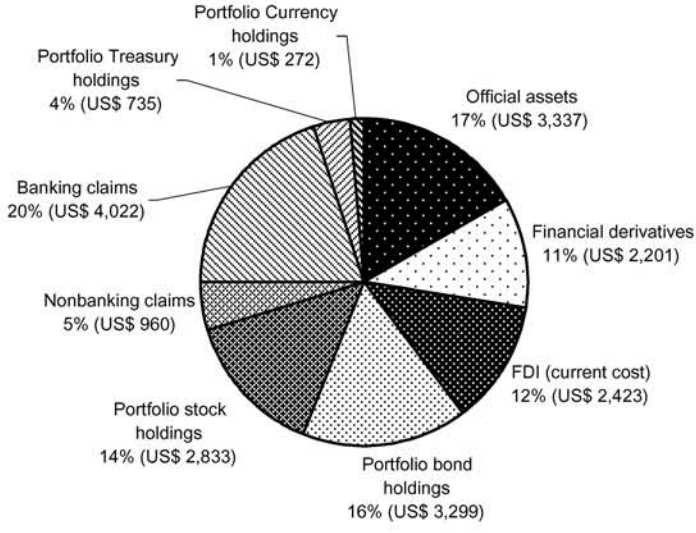
The composition of investment flows is in part determined by the willingness of the investor to accept greater risk in exchange for a potentially higher return. Chart 4-3a provides a breakdown of types of foreign assets accumulated by U.S. investors (including the government), and Chart 4-3b shows the types of U.S. assets accumulated by foreign investors. Relative to foreign investors in the United States, U.S. private investors have been relatively risk-tolerant in their holdings of foreign assets, particularly in holdings of private *portfolio* stocks and FDI. Portfolio stocks constituted 30 percent of total private foreign investment by U.S. investors in 2007, whereas they constituted 17 percent for foreign investors in the United States. Likewise, U.S. investors allocated 19 percent of their foreign holdings to FDI, whereas private foreign investors only allocated 14 percent of their U.S. investments to FDI. In keeping with their lower risk appetite, foreign private investors held twice the share of bonds, including U.S. Treasury bonds, in their U.S. asset holdings (24 percent of private investment) than U.S. investors held in their foreign asset holdings (9 percent of private investment). There was also a pronounced difference in official government holdings. Foreign governments and official institutions held 17 percent of all U.S. assets owned by foreigners, whereas the U.S. Government held only 2 percent of the total foreign assets in U.S. residents' possession. The majority of foreign official holdings of U.S. assets in 2007 were U.S. Treasury bonds and bonds issued by government-sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac.

Chart 4-3a **U.S. Holdings of Foreign Assets, 2007 (US$ bil)**
U.S. investors abroad are relatively risk-tolerant.



Source: Department of Commerce (Bureau of Economic Analysis).

Chart 4-3b **Foreign Holdings of U.S. Assets, 2007 (US$ bil)**
Foreign investors in the United States are relatively risk-averse.



Source: Department of Commerce (Bureau of Economic Analysis).

U.S. Investment and Investment Policy

Since the early 1980s, the United States has received more capital from foreign investors than U.S. residents invested abroad. Table 4-2 provides capital flow data for the years 2000 through 2007, the latest available data. There are many aspects about the United States that have proved attractive to foreign investors, including the size, diversity, liquidity, and depth of U.S. financial markets. According to one estimate, U.S. financial markets accounted for approximately one-third of the world supply of financial assets in 2006 (the latest year for which data are available). The U.S. share of the world supply of securities available to investors may even be much higher, given that in many countries the fraction of a company's shares available on the market may be much lower due to the large controlling stake in the company held by the government, a financial institution, or a family. In addition, U.S. markets offer strong minority shareholder rights and other property rights, a large domestic market, opportunities to invest in technological innovation, and demographic trends that result in a younger and faster-growing population than in most other advanced nations.

Much attention has been given to the large purchases of U.S. assets by foreign governments (primarily central banks and sovereign wealth funds; see Box 4-2). Although official flows (primarily foreign exchange reserves invested in the United States) are important, private flows are much larger. In 2000, for example, total foreign capital inflows into the United States were $1,038 billion of which private capital flows were $995 billion, or 96 percent of the total. Since then the share of *private* flows has not fallen below 68 percent, and it stood at 80 percent in 2007, the last year for which data are available. FDI and other investment flows are likely to be affected, even if only in the short to medium term, by the current financial crisis. This is the subject of Box 4-3.

TABLE 4-2.—*Capital Flows into and out of the United States (billions of U.S. dollars)*

	2000	2001	2002	2003	2004	2005	2006	2007
Foreign Capital Inflow	$1,038	$783	$795	$858	$1,533	$1,247	$2,061	$2,058
Of Which: Private Flows	995	755	679	580	1,135	988	1,573	1,647
U.S. Capital Outflow	561	383	295	325	1,001	547	1,252	1,290
Net Capital Inflow into the U.S.	417	385	461	523	625	729	788	731

Note: The net capital inflow figures are equal to those reported as the current account. This series differs from a straight subtraction of outflows from inflows due to omissions of certain types of financial transactions and statistical discrepancies.
Source: Department of Commerce (Bureau of Economic Analysis).

Box 4-2: Sovereign Wealth Funds

A *sovereign wealth fund* (SWF) is a state-owned investment fund. While there is no widely recognized definition of a SWF, typical hallmarks include that it holds foreign financial assets; makes some long- or medium-term investments that are riskier than the safe, liquid assets that make up official foreign currency reserves held for balance of payments or monetary policy purposes; and has few or no defined obligations, such as paying pension benefits or other specific liabilities. Nations may create SWFs for many purposes, including to earn higher returns on foreign currency holdings in excess of desired reserve assets, stabilize fiscal revenues, save wealth across generations, or fund development projects. SWFs are typically funded through commodity exports such as oil, gas, or diamonds, or through transfer of official foreign reserves accumulated as a result of large trade surpluses. Examples of some large SWFs include the United Arab Emirates' Abu Dhabi Investment Authority, Norway's Norges Bank Investment Management, the Government of Singapore Investment Corporation, and the China Investment Corporation.

Sovereign wealth funds have existed at least since the 1950s, but the amount of money estimated to be in such funds has increased dramatically in the past 10 to 15 years. One recent study estimates that SWFs currently manage $3.6 trillion in assets, and that total could rise to $10 trillion by 2015, although recent decreases in commodity prices will lower this projection. In 2006–2007, the amount of assets held by SWFs was large compared to the amounts held by private equity ($0.8 trillion) and hedge funds ($1.9 trillion), but was dwarfed by the assets held by insurance companies, mutual funds, and pension funds (on the order of $20 trillion each).

Sovereign wealth funds have the potential to promote global financial stability by acting as long-term, stable investors that provide significant capital to the system. They are not typically highly leveraged and would therefore not be under pressure to sell off assets for the purpose of meeting debt obligations. At the same time, the performance incentives that SWFs face remain opaque, and like all large, concentrated investors, SWFs could cause market volatility by abruptly shifting their asset allocations to avoid losses. The extent to which SWFs act as a stabilizing force in financial markets is an open empirical question that may be difficult to answer due to the lack of transparency of many SWFs.

Foreign investment, including investment by SWFs, provides capital to U.S. businesses, improves productivity, and creates jobs. The United States is currently the largest recipient of SWF investment. Investment

continued on the next page

Box 4-2 — continued

from SWFs has helped to shore up financial institutions during the credit crisis: sovereign wealth funds invested an estimated $92 billion in global financial institutions from January 2007 to July 2008.

The increasing size of SWFs in global financial markets has prompted some concern, however. For recipient countries, ownership of sensitive assets by foreign governments may pose national security concerns. High-profile investments by SWFs may also provoke a protectionist backlash against foreign investment. In April 2008, the Organization for Economic Co-operation and Development (OECD) published investment policy principles for countries that receive SWF investment, endorsing long-standing OECD principles against protectionist investment barriers and for nondiscriminatory treatment of investors. The principles stress that when additional investment restrictions are required to address legitimate national security concerns, then investment safeguards by recipient countries should be transparent and predictable, proportional to clearly identified national security risks, and supportive of accountability.

Countries that own SWFs have also raised concerns about the governance and accountability of these funds, and recognize that it is in their interest to ensure that their money is invested well. In October 2008, a group of 23 countries with SWFs published the Generally Accepted Principles and Practices, known as the "Santiago Principles," for sovereign wealth funds. The voluntary principles stress that SWFs should be transparent and accountable and should make investment decisions based on commercial principles. Adherence to these principles not only will help ensure that SWFs are well managed, but will have the additional benefit of reassuring recipient countries that SWF investments are financially stable and are economically and financially motivated.

Box 4-3: The Effect of the Current Economic Slowdown on Foreign Investment into the United States.

The large capital inflows into the United States over the past decade have led to many benefits described in this chapter. It is too early to say definitively how the financial crisis will affect these inflows. There are two aspects to this issue. First, there is the question of whether the supply of credit that net-saver nations provide to the rest of the world will be reduced. This credit has primarily flowed from Asian economies

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Box 4-3 — continued

(including Japan's), whose combined current account surplus (a measure of capital outflows) was $608 billion higher in 2007 than it was in 1997, and Middle East economies, whose combined current account surplus was $253 billion higher in 2007 than in 1997. To the extent that the recent slowdown in global economic activity reduces demand for Asian exports and petroleum products (as well as other commodities), the net savings available from these nations may fall if savings rates do not rise sharply. Moreover, foreign countries' savings are also likely to decline if governments decide to engage in higher spending to boost their flagging economies, thereby lowering the amount of government saving. Such spending would reduce the gap between national saving and domestic investment and reduce the supply of credit to the rest of the world, raising world interest rates.

The second question is whether the cost of foreign savings to the United States will rise. This depends on U.S. demand for foreign savings and the relative desirability of U.S. assets for foreign investors. The rising U.S. demand for foreign savings over the past decade is evident in Table 4-2. To add further evidence, the current account *deficit* of the United States (equal to net capital inflows) was $591 billion higher in 2007 than in 1997, and the United States received net investment from the rest of the world equal to 1.3 percent of world GDP in 2007, compared with average net foreign investment in the United States equal to 0.7 percent of world GDP from 1994 to 2001. Although predictions vary, U.S. imports and exports are both anticipated to fall sharply, likely leading to continued high levels of net capital inflows, and therefore high demand for foreign savings. If other nations that have relied on net capital inflows also maintain their same level of demand for foreign savings as well, unchanged demand in the United States for a potentially shrinking supply of global savings would tend to raise the cost of obtaining these inflows.

Yet the cost of foreign savings has not increased for the United States, and this primarily reflects an increase in the relative desirability of U.S. Treasury bonds for global investors. The net inflow of foreign savings into U.S. Treasuries has permitted the U.S. Government to borrow at a relatively low cost, and this has so far helped cushion the impact of the crisis on the U.S. economy. The relative desirability of U.S. Government bonds reflects a seismic decrease in global investors' appetite for risk. This has generated enormous demand for low risk assets such as U.S. Treasuries. If global investors' appetite for risk returns, demand for Treasuries will likely fall and whether the cost of foreign savings will rise for the United States will depend on the relative attractiveness of U.S. investments compared to opportunities abroad.

Foreign Direct Investment into the United States

For statistical purposes, the United States defines foreign direct investment (FDI) as the acquisition of at least 10 percent of an existing U.S. business, or the establishment of a new business, by a foreign person. The business acquired or formed as a result of the FDI is known as a U.S. affiliate of the foreign *parent*. Outlays for new FDI into the United States rose in 2006 and 2007, and the rate of increase of spending for new FDI greatly exceeded the rate of increase of U.S. merger and acquisition activity. Of total new FDI outlays into the United States of $277 billion in 2007, $255 billion (92 percent) was for the acquisition of existing U.S. firms, while $22 billion (8 percent) was for the establishment of entirely new businesses, according to preliminary data. In 2006, the three countries with the greatest production (or *value added*) by U.S. affiliates as a share of total U.S. affiliate production were the United Kingdom (19.6 percent), Japan (12.3 percent), and Germany (11.0 percent). The three biggest industry recipients of FDI new investment outlays in 2007 were manufacturing (49 percent), finance and insurance (9 percent), and real estate and rental and leasing (7 percent).

U.S. affiliates of foreign businesses are a large force in the U.S. economy, and their importance has increased in certain ways. Over the past 20 years, U.S. affiliates have increased their contribution to U.S. production from 3.8 percent of U.S. private sector production in 1988 to 6.1 percent of production by 2006 (the latest year available). The employment share of U.S. affiliates reached 4.6 percent in 2006. In 2007, newly acquired or established U.S. affiliates employed 487,600 people (including 147,500 in manufacturing and 143,600 in retail).

Although U.S. affiliates of foreign businesses are distinguished by relatively high wages and productivity, these attributes may reflect the nature of the industries to which FDI is attracted rather than any special attribute of foreign ownership itself. However, the ability to sell a business to foreign investors interested in acquiring new technology creates an incentive for entrepreneurs to innovate by increasing the potential rewards. There are other benefits as well. Studies that investigate the unique benefits of FDI, as opposed to other forms of foreign financing, typically claim that FDI can introduce new technologies to domestic industries and increase the nation's growth rate as these new technologies are adopted and spread throughout the economy.

Efforts to measure *technological spillovers* have often come to conflicting conclusions about the extent of these benefits. Many studies indicate that the benefits of FDI for the host country depend heavily on context. One recent study, for example, finds results that are sensitive to the level of worker education in the region where the investment is being made. Its findings indicate that FDI stimulates economic growth most for U.S. States where worker education exceeds certain threshold levels.

U.S. affiliates may be most productive if they are located near other firms with similar technical and knowledge requirements, or near a large number of workers with specialized skills and suppliers with specialized inputs. A recent study that finds that U.S. affiliates tend to cluster in specific areas (often with other U.S. affiliates with parents from the same country). For example, Connecticut and South Carolina tied for the largest U.S. affiliate share of private industry employment at 7.1 percent. Most of the U.S. affiliates in Connecticut were controlled by Dutch businesses, whereas the U.S. affiliates in South Carolina were heavily associated with German businesses.

Foreign Investment Policy

The perception that openness to foreign investment must be traded off against security is misguided. Foreign investment gives investors in other countries an economic stake in the prosperity of the United States, creating an incentive to support policies that are good for U.S. growth and stability. Nonetheless, foreign acquisition of assets or businesses may create a risk to national security if production of key resources could be disrupted or if sensitive information or technologies may be disclosed. The Exon-Florio provision of the Defense Production Act of 1950, which became law in 1988, provides for the President or the President's designee to review certain foreign investments in the United States. If a transaction threatens to impair national security, the President is authorized to prohibit the transaction.

In October 2007, the Foreign Investment and National Security Act of 2007 (FINSA) became effective, amending Exon-Florio in various ways, including by codifying the structure, role, process, and responsibilities of the interagency Committee on Foreign Investment in the United States (CFIUS), which has been designated by the President to undertake Exon-Florio reviews since 1988. Although FINSA expands government oversight of some foreign acquisitions, it also increases the transparency and predictability of the CFIUS process. With the publication of final regulations in November 2008, FINSA is now fully implemented.

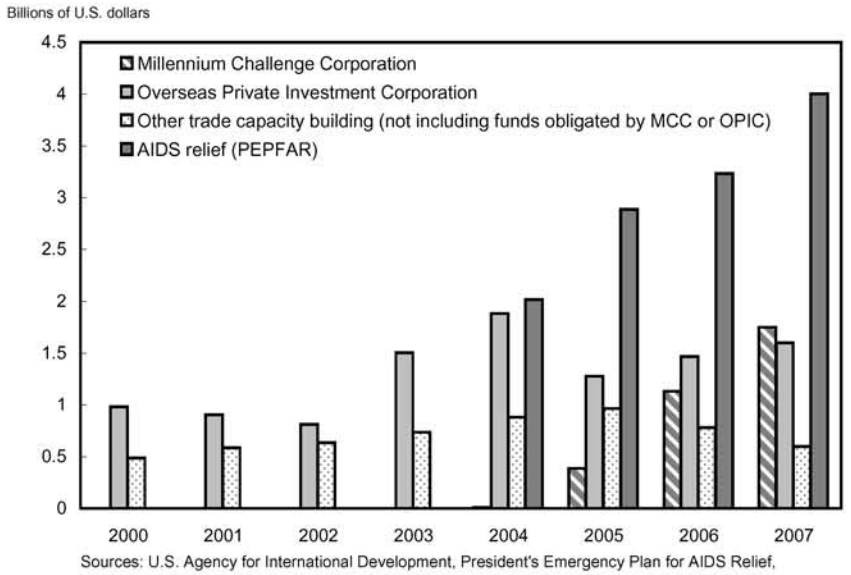
Development Assistance Initiatives

The United States benefits from increased trade as other economies grow and become more open, but the main benefits of development assistance programs include improving the lives of disadvantaged populations, increasing economic and political stability abroad, and fostering closer ties to the United States. The United States has many long-standing economic assistance commitments, including those funded through the United States Agency for International Development (USAID), the Departments of State

and Defense, and funding for multilateral development institutions such as the World Bank. Under this Administration, the United States has initiated and expanded specific economic assistance programs in developing economies, particularly those that practice good governance; make trade a prominent feature of their development plans; and demonstrate a commitment to taking ownership of the reforms, planning, and logistics required for the success of development programs and projects. Economic assistance programs, including trade capacity building (TCB) programs, are provided primarily by the Millennium Challenge Corporation (MCC) and USAID, and investment promotion programs are provided by the Overseas Private Investment Corporation (OPIC). The United States offers developing countries, particularly the least developed, preferential access to the U.S. market through several preferential trade programs. The United States also has health and education initiatives such as the President's Emergency Plan for AIDS Relief (PEPFAR).

To put these programs in context, U.S. spending on four of these initiatives from fiscal year 2000 to 2007 is shown in Chart 4-4. MCC has had a steady increase in funding since its inception in 2004. Spending on "Other TCB" in Chart 4-4 does not include TCB funds that are already included in spending by MCC and OPIC; overall, TCB funding rose to $2.3 billion in 2008. The highest spending from 2004 through 2006 was on PEPFAR, reaching $4 billion in 2007. The MCC, TCB, and OPIC, in addition to trade preference

Chart 4-4 **U.S. Obligations on Select Development Assistance Initiatives, 2000-2007**
Spending on innovative new development initiatives such as PEPFAR and the MCC has increased significantly.



Sources: U.S. Agency for International Development, President's Emergency Plan for AIDS Relief, Millennium Challenge Corporation, and Overseas Private Investment Corporation.

programs, are each discussed below, while PEPFAR is described in the section on health programs in Chapter 7.

Millennium Challenge Corporation

In 2002, the President announced the creation of the Millennium Challenge Account (MCA), a new bilateral initiative aimed at reducing poverty through investment programs, or *compacts*, of up to five years with countries that practice good governance, provide economic freedoms, and invest in their people's health and education. The Millennium Challenge Corporation (MCC) was set up to administer the MCA, and the importance of the MCC's focus on reducing poverty through economic growth is supported by research showing that economic growth is an important precursor for poverty reduction. In recognition of this relationship, before approving projects, MCC gathers evidence that the problems to be addressed by potential MCC-funded projects are indeed critical constraints to a country's growth. The strong commitment by MCC to near-universal application of cost–benefit analysis and rigorous, state-of-the-art project evaluation will allow the development community to better understand and learn important lessons about the effectiveness of various types of aid projects. Without making advances in knowledge about which projects are effective, U.S. efforts to improve the lives of targeted populations may not ultimately succeed. Given that most of MCC's compacts are currently in progress, it is too early to evaluate whether MCC has met its objectives.

Trade Capacity Building

An important goal of U.S. trade policy is to create opportunities for individuals and companies in developing countries. Trade capacity building (TCB), also called Aid for Trade, helps developing countries build capacity so that they can take advantage of global markets and implement trade rules. Top priorities for this aid are to develop infrastructure, strengthen financial markets, improve customs operations, develop sound business environments, and facilitate trade. The United States is the largest single-country donor of TCB assistance, spending $2.3 billion in the 2008 fiscal year, and it has committed to provide $2.7 billion in annual spending by 2010.

A key component of TCB is improving key physical infrastructure needs—such as transportation, ports, telecommunications, electricity, and water—in developing regions. In recent years, the United States has supported road building in rural Colombia, pipeline rehabilitation in Georgia, and the construction of a new international airport in Ecuador. TCB funds also strengthen developing countries' financial infrastructure. A number of programs are aimed at improving the productivity and business practices in

micro-, small-, and medium-sized businesses, and at improving lending to these businesses.

Trade facilitation is another important part of TCB. Trade facilitation funds are used chiefly to modernize customs practices, promote exports from developing countries, and provide business support and training to help firms participate in global markets. Improvements in these areas are often key to generating new trade and investment flows in these countries. For example, trade may increase because improved customs practices reduce costs and shorten delivery times. The United States has supported projects to improve the flow of goods at the Kenya-Uganda border and along the route from coastal Namibia to South Africa. Investment may increase because trade facilitation addresses areas of chief concern to many international investors; a 2007 survey reported that customs and ports improvements are the highest priority for international investors in some emerging markets.

Recent U.S. trade agreements, such as the Dominican Republic-Central America-United States Free Trade Agreement, include a formal Committee on TCB to help trading partners implement the agreement and to smooth the transition to new trading regimes. The United States also promotes TCB more broadly. For example, the United States supports efforts by the WTO and the OECD to expand worldwide funding for Aid for Trade. This aid helps developing countries, particularly least-developed countries, enhance trade-related skills and improve infrastructure needed to expand trade and benefit from trade agreements. Along these lines, the Africa Global Competitiveness Initiative, announced by the President in 2005 to build on the African Growth and Opportunity Act, provides technical assistance to bolster the trade competitiveness of African countries. This initiative has been credited with supporting $35 million in exports by African Growth and Opportunity Act beneficiaries in 2007. The United States also supports the Integrated Framework that coordinates efforts by six multilateral organizations (including the International Monetary Fund, the World Bank, the WTO, and other organizations) to reduce poverty in developing countries by better integrating trade into national development strategies.

Investment Promotion Programs

The United States also facilitates investment in emerging and developing countries by U.S. companies through the Overseas Private Investment Corporation. According to the corporation's 2007 annual report, it has supported over $177 billion in U.S. investment abroad through its pioneering use of U.S. Government-backed political risk insurance, direct loans, guaranties, and equity funds. These investments, which help provide crucial opportunities to households and firms in developing economics, also contribute to increased foreign asset holdings of U.S. residents.

In addition, *bilateral investment treaties* foster market-oriented investment policies in partner countries, and support international standards for investment protection. In February 2008, the Administration signed a bilateral investment treaty with Rwanda. When implemented, it will bring the number of U.S. bilateral investment treaties in force to 41. The U.S. Government is pursuing investment treaties with key emerging markets, as demonstrated by the 2008 announcements of treaty negotiations with China, India, and Vietnam.

Trade Preference Programs

Four U.S. preference programs are among the central elements of U.S. trade policy to promote growth and stability in developing countries. These programs provide preferential duty-free access for thousands of products that would otherwise be subject to duty upon entry to the United States. The U.S. Generalized System of Preferences, for example, provides duty-free access to the U.S. market for over 3,400 products from 132 beneficiary developing countries, and provides even broader duty-free access for products from 44 least developed countries. In addition to the Generalized System of Preferences, U.S. preferential trade programs include the African Growth and Opportunity Act, the Caribbean Basin Initiative, and the Andean Trade Preference Act. These programs have been successful in increasing and diversifying developing countries' exports, which better integrates these countries into the global trading system and expands choices for U.S. manufacturers and consumers. These programs have also improved economic stability, promoted internationally recognized labor rights, and provided adequate and effective means to secure and enforce property rights, including intellectual property rights. Researchers have cautioned that preference programs can have negative consequences if preferences divert limited resources in developing countries to sectors that would not otherwise be competitive. Research on specific U.S. programs, however, suggests that in general these programs have increased exports and improved welfare.

These programs have generated many successes. The Generalized System of Preferences has a large and geographically diverse impact. For example, for 15 beneficiary countries, more than one-third of their exports to the United States received preferential duty-free access under the program in 2007. Under the Caribbean Basin Initiative and the associated Haiti Hope Act, Haiti—the poorest country in the Western Hemisphere—increased apparel exports to the United States by 75 percent between 2000 and 2007. These benefits helped to preserve an important sector of the Haitian economy. The African Growth and Opportunity Act has also been successful in increasing trade. For January to October 2008, exports from the original African beneficiary countries to the United States increased over 250 percent compared to

the same period in 2001, and exports that entered the United States duty free under the program exceeded $50 billion, up almost 700 percent. U.S. exports to sub-Saharan Africa more than doubled in the same period, totaling over $15 billion in 2008 through October.

Trade Policy Going Forward

Notwithstanding the rapid increase in U.S. regional and bilateral trade and investment agreements, the multilateral trading system remains at the heart of U.S. trade policy. The rules-based multilateral system of the WTO is the essential foundation of an increasingly integrated global economy, and the WTO remains the single best forum to generate progress on many global trade and investment issues. Such issues include reducing trade-distorting support and protection for agricultural sectors maintained by many countries, both developing and developed; and liberalizing trade barriers and burdensome restrictions on FDI in services sectors in developing countries.

The United States must continue to lead international efforts to address these and similar issues in order to expand the benefits of open markets and economic integration. In particular, the WTO Doha Round remains a top U.S. trade policy objective, with the goal of concluding an agreement that creates new trade flows in agricultural, industrial, and services markets that will expand global economic growth, development, and opportunity. The United States and many other countries remain committed to reaching a successful final agreement that achieves an ambitious market-opening outcome for both developed and developing countries.

In the history of global trade liberalization, there has not been smooth and uniform progress toward ever lower barriers. There have been long periods of inactivity or, worse, periods of rising protectionism. Previous periods of economic hardship have often coincided with an increase in protectionism and economic isolationism; for example, the use of nontariff barriers such as quotas rose in the 1970s and 1980s. In the current troubled economic environment, an increase in protectionism at home or abroad could further slow global economic progress. Limiting trade would jeopardize the strongest engine of growth of the past 2 years in the U.S. economy. In the short term, the United States must provide global leadership to oppose any resurgence of protectionism, while continuing to recognize and support the extensive benefits that an open trade and investment environment conveys.

In the longer term, the forces of greater global economic integration appear strong. During this Administration, as the United States implemented FTAs with 13 countries, more than 100 other countries put more than 75 other FTAs into force. Other nations will press forward and so must the United

States to avoid becoming economically disadvantaged in foreign markets. The United States should continue to pursue free trade agreements and, in particular, put into force those that have already been negotiated. The growth in bilateral agreements further emphasizes the importance of multilateral initiatives such as the WTO Doha Round, which can magnify gains by simultaneously reducing barriers in many countries, ensure that the benefits of market access are shared more widely among nations, and lead to transparent and less complex global trading rules.

Conclusion

The United States' commitment to openness in trade and investment and promotion of open markets abroad has led to a greater diversity in consumer choices, more exposure to new technologies and ideas, and higher levels of investment and economic growth than would otherwise have been possible. Openness to trade and investment has contributed to higher U.S. standards of living and has allowed the United States some structural flexibility to cushion economic shocks. On balance, strong links to other economies are likely to increase the resilience of the U.S. economy in the short and long term, even taking into account the potential for negative shocks, such as a decline in demand for U.S. exports. Short-run hardships will surely occur, and it may take some time for current weaknesses to be resolved, but the U.S. commitment to openness provides substantial benefits in both the short and long run.

With regard to trade, the U.S. commitment to openness has been most evident in the increased number of U.S. free trade agreements. These agreements have improved the competitiveness and performance of U.S. producers abroad and have provided substantial savings for U.S. producers and consumers at home. In investment, the United States has benefited from inflows of capital from abroad. Although it is unclear how future flows will be affected by the current crisis, U.S. investors have historically earned high returns on their investments abroad. The recent reform of the Committee on Foreign Investment in the United States represents a careful effort to remain open to foreign investors while safeguarding national security.

U.S. development assistance has supported openness in developing and emerging economies through investment in infrastructure, trade capacity building, trade preference programs, and investment promotion. U.S. efforts to relieve poverty and promote economic growth and stability have helped numerous developing countries. In addition, the United States' continued promotion of trade with developing countries will improve their access to, and ability to benefit from, global markets.

CHAPTER 5

Tax Policy

Economists agree that taxes affect people's incentives and behavior. For example, allowing tax deductions for educational expenses makes it cheaper to go to college, which may encourage more people to go to college. Taxes can also discourage people from engaging in certain activities. Taxes on cigarettes, for example, make them more expensive to purchase, which may discourage people from buying them. Similarly, taxes on *dividends* (periodic distributions of a firm's profits to stockholders) and *capital gains* (the growth in value of an asset, such as corporate stock) decrease the return people receive from investing their money, which might cause them to invest less. When a higher tax rate is imposed on an activity, people have less incentive to engage in that activity. To encourage people to work and invest more, the tax rates on labor and investment income should be reduced. Over the past 8 years, several policy changes have resulted in lower tax rates for both individuals and businesses.

Individual income tax rates for all income levels are lower now than they were in 2001. Also, specific incentives have been established to reduce the adverse tax consequences of certain desirable activities, from running a small business to buying an alternative-fuel vehicle. Lower tax rates have increased the benefit to these activities; in particular, lower tax rates on dividends and capital gains helped business investment expand, thereby increasing the amount of capital per worker which improves worker productivity. Tax relief has contributed to the solid economic growth and job creation that prevailed over most of the past several years.

However, important challenges remain. Foremost among these is the fact that most of these tax reductions are scheduled to expire at the end of 2010. Allowing them to expire would constitute one of the largest tax increases in history and could have serious consequences for the U.S. economy. Another challenge is to further reduce business tax burdens and thereby encourage business investment in the United States. The United States should continue to attract such investment in today's global economy in order to develop better jobs for U.S. workers and to continue improving our standard of living.

Of course, individuals and businesses would prefer not to be taxed at all. Yet governments perform many functions desired by citizens—such as building roads and bridges, maintaining law and order, and providing for the national defense—and impose taxes to raise revenue for these activities. While this chapter focuses on the economic effects of taxes, it should be noted that this is only one side of the Government's budget; a complete analysis of

fiscal policy should consider the economic effects of both the revenue and spending sides of the budget.

The key points of this chapter are:

- Taxes alter individual and business incentives and have the potential to distort their behavior. This Administration consistently fought to reduce tax burdens on individuals and businesses; tax rates are now much lower than they were just 8 years ago.
- Tax reductions over the past 8 years have improved incentives to work, save, and invest.
- Globally, nations compete for businesses and the associated jobs; the United States may need to reduce tax rates on businesses to remain competitive in today's world.
- Future goals should include permanently extending the tax relief of the past 8 years and reforming the Alternative Minimum Tax (AMT).

Individual Income Tax Reform

Governments impose taxes to obtain the revenue needed to perform their duties. The transfer of resources from individuals to the government does not directly impose a burden on the overall economy because the ability to purchase goods and services shifts from the individual to the government—there is no net loss for the economy as a whole. However, taxes can impose a considerable burden on the economy for other reasons. Most significantly, taxes interfere with the efficient allocation of resources by altering the rewards from working, saving, and investing.

Resources are allocated efficiently when individuals and firms allocate them to the activities for which they are best suited, thus achieving the highest possible output for the economy. Without taxes, individuals and firms can allocate resources in the most efficient manner possible. With taxes, people receive lower benefits from taxed activities and adjust their behavior accordingly. (In some cases, such as when people engage in an activity that produces negative consequences for others, imposing a tax can improve economic efficiency; for example, high taxes on cigarettes can reduce the damage caused by secondhand smoke.)

High tax rates on labor income can induce people to reduce the time they spend working. This is particularly true for people with flexible work weeks and in households with a second worker. High tax rates on dividends and capital gains discourage people from investing and reduce the funds available in financial markets. In turn, this reduces business investment, which reduces the amount of capital available in the economy. Less capital means less machinery and equipment for each worker to use, making workers less

productive and leading to reductions in wages. The net result of these tax-caused changes is an inefficient allocation of resources: output is lower than it would have been in the absence of taxes. Economic research indicates that the total economic burden imposed on the economy for each dollar of income tax revenue collected actually exceeds 1 dollar, but estimates of the exact burden vary widely.

A second problem arises when people engage in activities to avoid paying taxes. The possibilities here include both legal activities, such as using complicated tax shelters to prevent income from being taxed, and illegal activities, such as not filing a tax return. While the great majority of people pay the taxes they owe, the latest Internal Revenue Service (IRS) estimate suggests that the gap between the amount of tax people owed and the amount actually paid was approximately $290 billion in 2001, or 13.7 percent of all taxes owed. One consequence of people failing to pay their fair share of taxes is that a higher tax rate must be imposed on those who do comply with tax laws in order to collect the desired amount of revenue.

Lowering Tax Rates Stimulates Economic Growth

Taxing earned income reduces incentives to work because it reduces the return from work. Similarly, taxing capital income (such as interest, dividends, and capital gains) reduces the return from saving and investing and therefore reduces the incentive to save and invest. The changes in incentives, along with any associated behavioral changes that result from changes in tax rates, are what economists mean when they assert that taxes "distort" the normal operation of labor and capital markets. When taxes are imposed on choices people make, distortions tend to occur and markets operate at less than peak efficiency. Because different types of taxes create different types and sizes of distortions, one goal of tax policy should be to choose tax rates that minimize the distortions and the accompanying inefficiencies whenever possible.

Key determinants of the effect a tax system has on the economy are the *average tax rate*—the fraction of income paid in taxes—and the *marginal tax rate*—the amount of tax owed on an additional (that is, marginal) dollar of income. A high average tax rate tends to discourage people from engaging in an activity at all. For example, a high average tax rate on labor income can reduce the total after-tax return so much that it discourages people from working at all. In contrast, a high marginal tax rate on labor income reduces an individual's after-tax return from *increased* work effort and from investing in additional education. The example in Box 5-1 examines this particular issue in more detail. Because education levels positively affect productivity, economic growth will generally be higher when people acquire more education.

By reducing both average and marginal tax rates on labor and capital income at almost every income level, the tax policies of the past 8 years reduced the distortionary effects of these taxes and thereby improved the efficiency of the labor and capital markets and of the U.S. economy as a whole.

Box 5-1: Encouraging Human Capital Investment

High marginal tax rates can discourage people from pursuing additional education and improving their skills to qualify for a higher-paying job. To see this, consider a high school teacher who is choosing between continuing to work for about $50,000 per year (the median salary for high school teachers in 2007), and getting additional education so he can become a school principal and earn $80,000 per year (the median salary for elementary and secondary education administrators in 2007). Although there may be other factors, suppose this worker's main concern is his after-tax income.

Consider the impact of two different tax regimes: In the first regime, assume the high school teacher would owe $5,000 per year in income tax and the principal would owe $12,500 per year in income tax. The difference, $7,500, is the additional tax he would owe if he were to acquire the skills needed to be a principal. Comparing this amount to the expected increase in income ($30,000), we see that the marginal tax rate imposed on the additional income is 25 percent ($7,500/$30,000). In the second regime, assume an alternate tax system in which the high school teacher owes $3,000 per year in tax and the principal owes $15,000 per year in tax. Under this new system, the tax impact of acquiring additional skills is $12,000. Comparing this to the expected increase in income (still $30,000) reveals that the marginal tax rate imposed on the additional income is 40 percent ($12,000/$30,000).

The larger marginal tax rate in the second regime means the worker experiences a smaller increase in after-tax income; thus, his incentive to acquire the skills necessary for the higher-paying job is smaller in this regime and may cause him not to pursue additional education.

As an aside, notice that if the worker chooses to stay a high school teacher, he pays more in income tax in the first regime ($5,000) than he would in the second ($3,000). Part of the reason the first regime has a lower marginal tax rate for additional education is that there is a higher average tax rate on lower-earning individuals than in the second regime.

Increased Work Incentives

A labor income tax decreases the incentive workers have to supply labor to the market by reducing their take-home pay. Workers may choose to work fewer hours, and some may even choose not to work at all. These behavioral changes reduce the efficiency of the labor market and of the economy as a whole. The tax relief of 2001 reduced tax rates on labor income and thereby reduced the distortions and efficiency losses created by taxing wages.

Economists have found that different people can be affected differently by taxes. Some people exhibit very little change in labor supply as tax rates vary, while others may enter or exit the workforce entirely. Consider a married couple in which one person works at a full-time job; call this person the primary breadwinner for the family and assume he makes $50,000 per year and works a fixed 40-hour week. The other person has the option of working at an hourly job and can earn up to $10,000 per year, depending on how many hours she works; call this person the secondary earner. When there is a change in tax rates, the breadwinner will probably continue to work the same amount of time because of the importance of his income to the family and his fixed work hours. However, the work decisions for the secondary earner are not as clear. Because married couples are taxed on their combined income, any income earned by the secondary earner will be taxed at the marginal tax rate facing the couple. Because an income tax lowers the reward for working outside the home, it makes other activities (such as leisure or raising a family) look relatively more attractive compared to work. An increase in the marginal tax rate facing the couple could reduce the return the secondary earner receives from working by enough to cause her to choose not to work at all. Alternatively, if a worker wants to earn a specific amount of income, higher tax rates could cause her to increase work time.

In practice, economists find the labor supply of married men to be relatively stable regardless of changes in tax rates. Research shows, however, the labor supply of married women to be quite sensitive to changes in tax rates, although this sensitivity has declined over the last few decades as labor force participation by women aged 25–54 increased from about 50 percent in 1970 to over 75 percent in 2008.

The tax relief of the past 8 years reduced marginal tax rates at almost every income level, reduced the distortions inherent in taxing earned income, and thereby increased the rewards from working and encouraged more people to work. In addition, tax relief that reduced marriage penalties improved the incentives for secondary earners to participate in the labor force.

Increased Saving and Investment Incentives

When individuals receive income, they can either spend it for current consumption or save it to finance future consumption. Financial intermediaries, such as banks and insurance companies, pool individual savings to finance capital investments. For example, a bank may combine the savings deposits of many individuals to make a loan to a small business owner. The business owner plans to make a profit so she can pay interest on her loan, which the bank uses to pay interest to the depositors. Similarly, when people purchase stock in a company, the company can use the funds to invest in new machinery and equipment. These new assets generate income for the company that gets returned to the investor in the form of dividends or capital gains. These investments increase the amount of machinery and equipment used by each worker, raising the productivity of workers; this helps to increase workers' wages and, ultimately, increases the average standard of living for Americans.

An important tax policy issue is the double taxation of income earned from saving and investing. Taxing this income discourages individual saving and investment, which reduces the funds available to finance new businesses and for existing businesses to expand. Currently, corporations first pay tax on their profit, then the after-tax profit is either distributed to shareholders as dividends or reinvested in the company by retaining it and allowing shareholders to benefit via capital gains (that is, increased equity); either way, the shareholder then pays taxes on the income he or she earns. As a result, income from new capital investment by corporations, financed by individual equity investment, is taxed twice—once by a tax on the corporation's profit, and again by a tax on the dividends and capital gains earned by the individual investor. This double taxation of corporate income generates an effective tax rate on equity investment that is greater than either the statutory corporate tax rate or the individual income tax rate. Ultimately, such taxes lower the capital-to-labor ratio, suppress wages, and harm long-run economic growth. Box 5-2 gives an example of how double taxation can slow economic growth.

The tax reductions of the past 8 years increased individual incentives to save and invest. In 2001, the top marginal income tax rate was reduced from 39.6 percent to 35 percent, thus reducing the tax on flow-through businesses (businesses whose profits are not taxed directly; instead, any profit they earn "flows through" the business to the owners, who then pay individual income tax on it). Before 2003, capital gains were taxed at a maximum of 20 percent, and dividends were taxed as ordinary income (at a maximum rate of 38.6 percent in 2002). As part of the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA), the maximum tax rate for long-term capital gains and dividends was reduced to 15 percent. (The next section elaborates on the significance of reducing tax rates on dividend income.)

Box 5-2: Double Taxation Slows Economic Growth

From an individual perspective, the act of saving reduces consumption today so more can be consumed in the future. Similarly, when firms invest they reduce present production so they can be more productive and profitable in the future. Taxing capital income lowers the return to saving and investment, which encourages current consumption and discourages future consumption. For example, suppose a corporation is considering selling additional stock to finance the construction of a new plant. The corporation expects that the *net return* on this investment (the return after subtracting depreciation) will be 10 percent. Suppose further that individuals will purchase the shares if they receive a return of at least 6 percent. The investment is socially beneficial because it generates a higher return (10 percent) than the savers providing the funds require (6 percent).

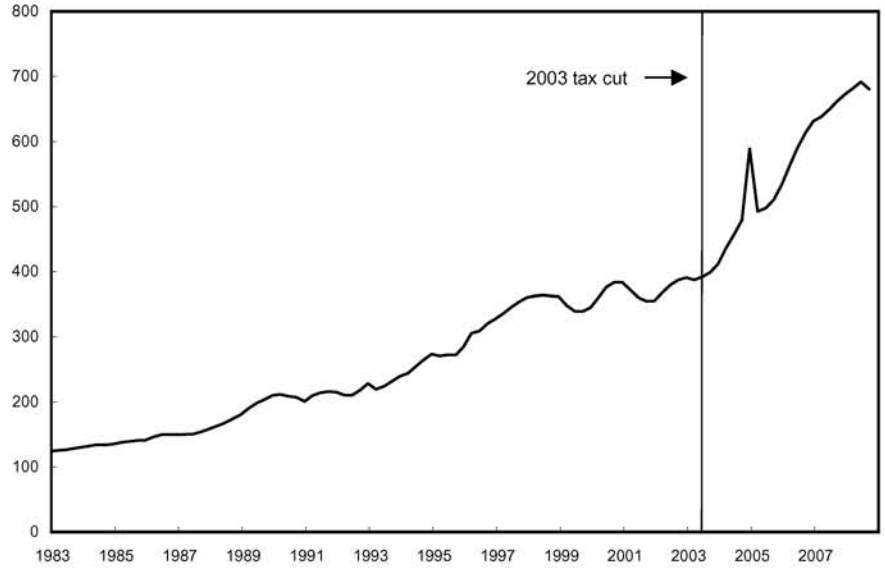
When the new plant begins operating, the income it generates for the firm is subject to the corporate income tax; currently, the corporate income tax has a top marginal rate of 35 percent. Similarly, individuals investing in the firm owe tax on the income they receive from their investments; currently, the top marginal rate on dividends and long-term capital gains is 15 percent.

Now consider an individual who invests $1,000 in the company's new stock. The new plant generates $100 of net income on this investment. The firm owes 35 percent in tax, leaving $65 of after-tax profit for the firm. Suppose the firm immediately returns all of this money to the investor as a dividend. The investor owes 15 percent in tax, leaving about $55 for her to use. That is, after applying the two taxes, the investor receives a return of only 5.5 percent on her initial investment. Because this is less than her required return of 6 percent she will choose not to invest in this company's stock and the new plant would not be built. In summary, taxing both corporate income and individual capital income can produce an effective tax rate high enough to alter saving and investment decisions enough to cause socially beneficial projects to go unfunded.

Dividend Tax Relief

A major Administration accomplishment was reducing the tax rate applied to corporate dividends. JGTRRA reclassified dividends so they are taxed at the same rate as long-term capital gains, currently a maximum of 15 percent. As Chart 5-1 shows, the change appears to have been effective in expanding dividend payments: since 2003, real dividend income has grown at an average of 11.1 percent per year, while from 1983 until 2003, real dividend income grew at an average of only 5.8 percent per year. (The 2004 spike in the chart reflects a special one-time dividend paid by Microsoft Corporation.)

Chart 5-1 **Real Personal Dividend Income**
Dividend payments have increased since the 2003 tax cut.
Billions of chained 2000 dollars, seasonally adjusted at an annual rate



Source: Department of Commerce (Bureau of Economic Analysis).

Reducing tax rates on corporate dividend payments directly reduces the double taxation of corporate income. It also reduces the incentive corporations have to use debt, rather than equity, to finance purchases of new capital. The fact that corporations can deduct interest payments from taxable income, but cannot deduct dividend payments, makes it cheaper for firms to borrow (rather than issue stock) to finance additional spending. Excessive borrowing increases the chances of insolvency because the higher a firm's debt payments, the greater the chance the firm's income will be insufficient to cover these payments. Insofar as insolvency triggers bankruptcy, this subjects equity holders and employees to additional costs and uncertainty.

Changing the tax treatment of dividends also reduced the tax bias against paying dividends compared to retaining earnings. Paying dividends returns funds to stockholders, who can decide for themselves how to use them, rather than having to leave the funds invested in a particular company. Also, paying dividends is a way firms can provide tangible evidence of their profitability. Clear signals about how profitable different firms are help investors identify the most efficient allocation of their resources. When the tax code penalizes dividends relative to capital gains and penalizes equity financing relative to debt financing, corporate financing decisions will be inefficient.

The Macroeconomic Benefits of Lower Tax Rates

Over the past 8 years, tax relief has reduced distortions to labor supply, saving, investment, and corporate governance. Making the tax relief permanent can substantially improve economic efficiency and increase economic activity. The Treasury Department estimates, for example, that if the tax relief of 2001 and 2003 were made permanent and were paid for by reductions in future government spending, economic output would increase by 0.7 percent in the long run. The benefits would be smaller or even negative, however, if the extension of the tax relief results in additional government borrowing or future tax increases rather than spending reductions. The Treasury Department estimates, for example, that if the tax relief were made permanent but the lost revenues were made up with other tax increases, economic output would decline by 0.9 percent over the long run. The concern about long-term financing for the tax relief is particularly important because of the likelihood of rising spending pressures in the future, as discussed in Chapter 6.

A Record of Tax Reform

One of the Administration's major tax policy objectives has been to change tax laws so they better encourage activities that are beneficial to the economy as a whole, such as work effort, saving and investing, education, and the creation of new jobs. With regard to individual income taxes, the Administration took steps each year to reduce the burden imposed on the American taxpayer. Here are some of the highlights of the actions taken:

- The Economic Growth and Tax Relief Reconciliation Act of 2001 was the most significant tax reduction since 1981. It created a new low 10 percent tax bracket and phased in reductions of the other existing marginal tax rates. It reduced marriage penalties by increasing the standard deduction and the lowest tax bracket threshold for married taxpayers, increased the child tax credit, and made many other tax preferences more generous. It also began phasing out the estate tax.
- The Jobs and Growth Tax Relief Reconciliation Act of 2003 accelerated the phasing-in of many of the tax reductions enacted in 2001. It also reduced capital gains tax rates and applied the capital gains tax rates to dividends.
- The Working Families Tax Relief Act of 2004 and American Jobs Creation Act of 2004 further accelerated the tax reductions previously enacted, including increasing the child tax credit to $1,000. These laws further reduced marriage penalties by making the standard deduction for joint returns twice the single standard deduction, and expanding the

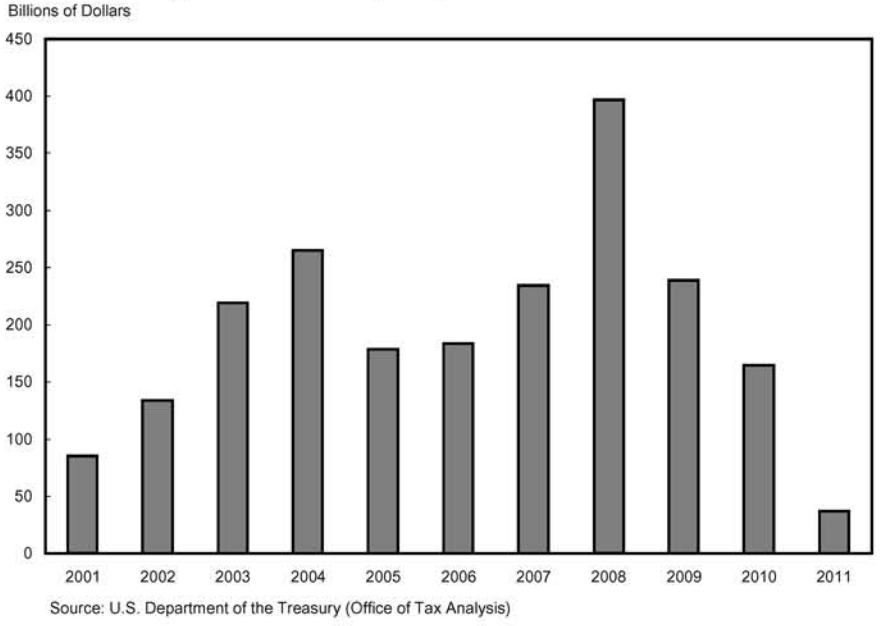
10 and 15 percent tax brackets for joint returns to twice the size of the corresponding brackets for single returns.

- The Pension Protection Act of 2006 made permanent a number of pension-related provisions of previous tax bills, such as higher dollar amounts for IRA contributions, higher dollar limits on defined contribution plans, and catch-up contributions for older workers.
- The Tax Increase Prevention Act (TIPA) of 2007 and the Emergency Economic Stabilization Act of 2008 each extended AMT relief. TIPA also increased the number of personal credits that could be used to reduce AMT liability.

Each of the above measures was intended to promote long-term growth and improve economic efficiency. Another significant measure was the Economic Stimulus Act of 2008, which returned approximately $100 billion to consumers via tax rebates—up to $600 per taxpayer ($1,200 for couples filing jointly) and $300 for each dependent. Rebates were phased out for taxpayers with over $75,000 in income (over $150,000 for couples filing jointly). On the business tax side, the Economic Stimulus Act increased the dollar value of new equipment that could be deducted in 2008 and provided an expanded depreciation allowance of 50 percent on certain business property put into service in 2008. The primary purpose of these actions was to provide short-term, counter-cyclical stimulus to the economy by encouraging short-run growth in consumer spending and business investment. Tax rebates were chosen as the best way to provide this short-term stimulus because of the speed with which they put money into the hands of people most likely to spend it. Similarly, the business tax incentives were designed to encourage firms to accelerate purchases of capital equipment, making such purchases in 2008 rather than waiting until 2009 or later. Compared to the paths consumption and investment would have otherwise followed, the rebates appear to have boosted real personal consumption expenditures in the second quarter of 2008 and the accelerated depreciation was expected to boost business investment throughout 2008.

In total, the tax relief enjoyed by taxpayers from 2001 to 2008 saved Americans nearly $1.7 trillion in taxes. Chart 5-2 illustrates how those benefits were distributed over these years. The value for 2008 includes over $100 billion from the Economic Stimulus Act of 2008. Aside from stimulus, the amount of tax relief granted to individuals declines after 2008 because of the expiration of temporary changes to the AMT (discussed in detail later in this chapter) and declines significantly in 2011 because most of the tax reductions are scheduled to expire at the end of 2010.

Chart 5-2 **Federal Income Tax Relief by Year**
Tax relief has already allowed families to keep nearly $1.7 trillion.



Source: U.S. Department of the Treasury (Office of Tax Analysis)

Lower Tax Burdens

As a result of the tax relief of the past 8 years, the average Federal individual income tax rate declined to 20.4 percent in 2008. Without tax relief, the average Federal tax rate would have been 24.2 percent. The top half of Table 5-1 shows the rates taxpayers at different income levels face in 2008 as a result of the tax relief of the past 8 years and the tax rates they would have faced if it were not for this tax relief. Notice that taxpayers at all income levels experienced a reduction in their average Federal tax rate for 2008. For example, among people in the lowest income quintile, the average Federal income tax rate would have been 5.2 percent without tax relief, but with tax relief it was only 1.1 percent; while for people in the highest income quintile, the average Federal income tax rate would have been 29 percent without tax relief, and with tax relief it was only 25.4 percent.

The distribution of the burden of Federal individual income taxes is shown in the bottom half of Table 5-1. Without tax relief, the lowest quintile would have borne 0.8 percent of the Federal tax burden in 2008. With tax relief, the lowest quintile bore only 0.2 percent of all Federal taxes. The highest income quintile was the only group to see its share of Federal taxes increase in 2008, from 66.3 percent of Federal taxes before tax relief to 68.9 percent after tax relief.

Table 5-1.—*Estimated 2008 Effects of Individual Income Tax Relief from the Past 8 Years*

Average Federal Tax Rates (percent)						
	Lowest Quintile	Second Quintile	Third Quintile	Fourth Quintile	Top Quintile	All
With Tax Cuts	1.1	8.3	15.0	18.1	25.4	20.4
Without Tax Cuts	5.2	13.0	18.9	21.9	29.0	24.2
Share of Federal Taxes (percent)						
	Lowest Quintile	Second Quintile	Third Quintile	Fourth Quintile	Top Quintile	All
With Tax Cuts	0.2	3.3	10.2	17.3	68.9	100.0
Without Tax Cuts	0.8	4.4	10.8	17.6	66.3	100.0

Source: Urban Institute and Brookings Institution Tax Policy Center.

Pro-Growth Business Tax Reform

Throughout the past 8 years, the Administration has worked consistently to lower the burden of taxes on businesses, with the objectives of encouraging greater investment, job creation, and long-term economic growth. To accomplish these goals, the Administration has pursued two primary strategies: first, addressing enduring aspects of the tax system that diminish returns on investment for both individuals and businesses; and second, providing new tax incentives for businesses to stimulate greater investment.

Reducing the Double Taxation of Corporate Income

As indicated earlier, one aspect of the current tax system that diminishes returns on investment is the practice of double taxation of corporate income, which reduces the return to saving and investing. The Administration's 2003 tax relief reduced the magnitude of double taxation by reducing the tax rate on both dividends and capital gains. In addition, there have been amendments to the legal structure of corporations that have helped reduce corporate tax burdens.

To understand these changes, it is first helpful to understand the basic framework of corporate taxation. The tax treatment of business income varies depending on the organizational structure of the firm. There are two basic classifications of corporations for purposes of taxation and regulation: (1) *C corporations*, the traditional large, stock-issuing corporations; and (2) *flow-through* businesses, which include S corporations, partnerships, and sole proprietorships. For tax purposes, the main difference between these two groups is that flow-through businesses are exempt from the corporate profits tax that is imposed on C corporations. In flow-through businesses, profits are distributed to owners and shareholders (flowing "through" the company

directly to their owners), who then pay income taxes on their gains. (There are restrictions on both size and financial activities that prevent most firms from qualifying to be S corporations.) This arrangement allows flow-through business owners to avoid the double taxation of corporate profits and to face lower effective tax rates than do shareholders of C corporations. One goal of tax relief has been to "level the playing field" by reducing the difference between the tax rates applied to income generated by S corporations and C corporations.

Two types of changes helped to reduce the burden of corporate taxes. First, regulatory changes in 2004 and 2007 relaxed some of the restrictions that limit which firms can be S corporations. In addition to increasing the maximum allowable number of shareholders, new rules were enacted to make it easier for a firm to elect to become, and to remain, an S corporation. Second, each year from 2002 to 2005, and again in 2008, allowances for depreciation deductions were extended or expanded. As described below, these changes allow firms to take a greater deduction from income when new capital equipment is purchased, which effectively decreases the tax burden on income generated by that equipment.

Accelerating Depreciation Allowances

A consistent goal of the Administration has been to provide tax incentives for businesses to invest in new facilities and equipment. One way this goal was promoted was by accelerating business depreciation allowances. When physical assets (such as machinery and equipment that can be used over and over when producing goods and services) are used by businesses, their value declines (depreciates) over time due to the wear and tear they experience. With this in mind, businesses are allowed to deduct from their taxable income the dollar amount of the depreciation of their assets. The more quickly a firm is able to deduct, through depreciation, the cost of new investment, the more attractive new investment becomes. Because different types of assets have different useful lives and therefore depreciate at different rates, the IRS established the Modified Accelerated Cost Recovery System, which specifies the rates at which different types of assets can be depreciated.

Accelerating depreciation rates improves investment incentives for firms. As part of a temporary stimulus program, the Administration succeeded in expanding businesses' first-year depreciation allowance on qualified property by an additional 30 percent of its adjusted basis in 2002, to encourage greater business investment in new machinery and equipment in that year. In 2003, to provide additional short-term stimulus, the first-year depreciation allowance was expanded further, to 50 percent of the adjusted basis for qualified property. This expanded depreciation allowance expired in 2004, but was reintroduced—at 50 percent of the adjusted basis—as part of the Economic Stimulus Act of 2008.

Increasing Small Business Expensing

In addition to accelerating business depreciation rates, the Administration has supported pro-growth business tax policies by increasing the amount of "expensing" small businesses can do for their use of depreciable property. Distinct from the traditional concept of "business expensing," which refers to a business's ability to deduct expenses incurred that are not associated with acquiring or improving assets, Section 179 of the U.S. Internal Revenue Code allows individuals and small businesses to deduct the cost of property used to generate income, rather than having to capitalize the benefits through the depreciation schedule discussed above. The Administration expanded the capability of businesses to expense the cost of property under Section 179; in 2003, the maximum dollar amount that could be expensed under Section 179 was increased to $100,000. In 2007 the limit was again increased, to $125,000, and indexed for inflation for 2008 through 2010. Then, as part of the Economic Stimulus Act of 2008, the limit was increased to $250,000 for 2008.

Tax Credits for Research and Development

Finally, a number of tax credits have been extended to businesses to encourage the types of research and development investment that have benefits for the public. Economists use the term "public goods" to describe things that could easily be used by more and more people with little or no additional production cost. From a social perspective, private companies generally make insufficient investments in public goods, such as scientific research to develop new technologies for health care or to expand utilization of renewable energy resources. This "underinvestment" occurs because companies pursue investment projects based on the potential value to themselves and generally do not consider the full benefit to society that could result from the investment.

For example, suppose a company was considering investing in research to develop a vaccine against diabetes. Once developed, the company would sell the drug at a price set high enough to recover its research costs and to generate some profit. Ultimately, the company would evaluate the merits of the investment based on the profit it expected to receive from selling the vaccine relative to the profit it could earn on other possible investments. Unfortunately, the price the firm would need to charge could exceed what some people who would benefit from the drug can afford to pay. As a result, some people who could benefit from the vaccine will not get it, and the company will underestimate the full value of this research investment. That is, the research will have a public value that is greater than its private value to the company. Put another way, for goods with large social benefits, private markets tend to offer smaller returns than are needed to result in efficient levels of investment.

Tax credits can be used to "fill the gap," by providing the company with an additional incentive that will encourage it to undertake this publicly beneficial investment. In the area of alternative energy, the Administration successfully extended existing research and development tax credits and expanded upon them in 2005 and 2006, providing an additional 20 percent credit for qualified energy research and increasing the percentage of research and development expenses that qualify for the credit. In 2005 and 2006, private industry research and development grew notably. Annual research and development spending by private industry grew by only 2.9 percent per year over the 20 years from 1985 through 2004. Subsequently, private industry research and development grew at an average rate of 5.1 percent per year in 2005 and 2006.

International Competitiveness

Today's global economy enjoys more economic interconnectedness than ever before. Efficiency improvements in information, communication, and transportation technologies have increased the ability of international firms to compete with U.S. firms in domestic and international markets. Associated improvements in the international mobility of capital mean that modern companies have a high degree of international flexibility regarding the location of new facilities. Thus, companies that want to open new facilities can compare investment opportunities across the globe to find locations with the highest after-tax return. As a result, a country's corporate tax policy, including its statutory tax rates, can have a significant impact on both job creation and the competitiveness of businesses within that country. There is ample evidence that companies include tax considerations when determining where to locate new facilities, a fact that has led to a sense of competition between countries as they try to attract companies by reducing their respective corporate tax rates.

To illustrate the trend toward lower corporate tax rates, Chart 5-3 shows the statutory corporate tax rate for the United States and the average (weighted by gross domestic product (GDP)) statutory corporate tax rate for non-U.S. members of the Organization for Economic Co-operation and Development (OECD) since 1981. (State and local rates are combined with the Federal statutory rates where appropriate.) During the early 1980s, the United States had a statutory corporate tax rate of nearly 50 percent, which was higher than the OECD average. Significant tax reform in 1986 reduced the United States's combined (Federal and State) rate to about 39 percent, a level it has roughly maintained since then. While this change reduced the U.S. tax rate to well below that of most other OECD countries in the late

1980s, other countries soon began reducing their corporate tax rates as well. By 2008, the non-U.S. OECD average corporate tax rate had fallen to about 30 percent, and the non-U.S. median corporate tax rate stood at 27.5 percent. Table 5-2 gives statutory tax rates for most OECD countries; the United States currently has the second highest statutory corporate tax rate of any industrialized country, less than 1 percentage point below Japan's.

That said, the United States offers companies a more generous depreciation allowance than do most other countries—only Italy and Greece offer greater allowances (see Table 5-2). When considered together, the high statutory tax rate in the United States is somewhat mitigated by its generous depreciation allowance. However, as shown in the last column of Table 5-2, the United States still has the fourth highest effective marginal tax rate on equity-financed projects, which can dampen the competitiveness of U.S. businesses and can dissuade firms from locating new facilities—and the associated jobs—here in the United States.

Future Challenges

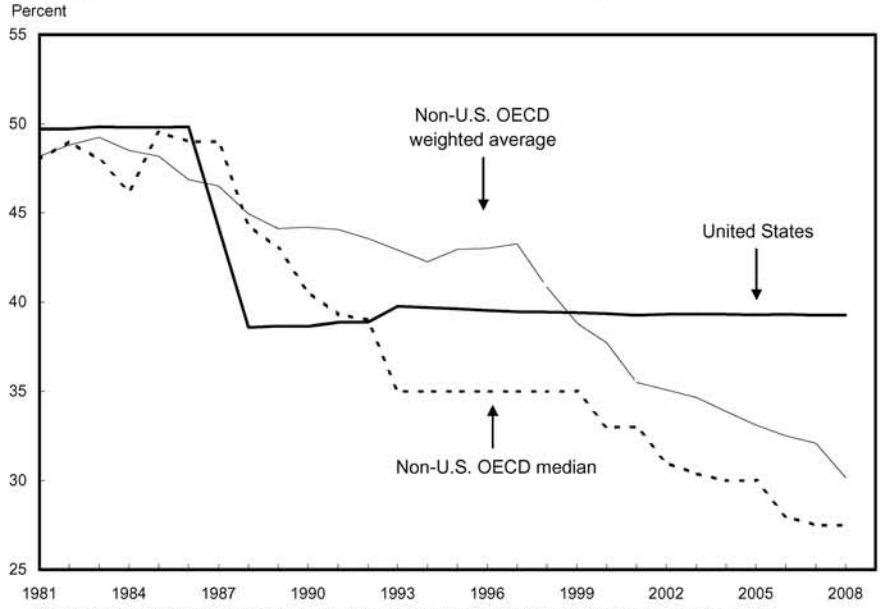
The tax policy changes of the past 8 years have considerably reduced the burden on taxpayers and improved the efficiency of U.S. income tax laws. However, there is more work to be done. In addition to making these changes a permanent part of the tax code, the AMT needs to be reformed or even eliminated, and the tax code should be greatly simplified because complying with its incredible complexity consumes resources that could be put to better use elsewhere.

Making Tax Relief Permanent

Failing to extend the tax relief enacted over the past 8 years would amount to one of the largest tax increases in history. Individuals at all income levels, from low-income Earned Income Tax Credit recipients to high-income taxpayers, would be negatively affected. The total increase would average nearly 1.9 percent of GDP per year over the next 10 years and would increase the tax burden on the economy to well above the average over the past 40 years of 18.3 percent of GDP.

Taxing business income reduces the incentive people have to invest in businesses. Tax relief has encouraged greater business investment over the last several years. Going back to the high tax rates of the 1990s could reduce business investment, which could in turn reduce workers' wages and economic growth. In an international context, higher corporate tax rates would make locating new businesses in the United States less attractive, and would further depress jobs and growth.

Chart 5-3 **Combined (Federal and State) Corporate Income Tax Rate**
U.S. corporate tax rates are now well above those of most other developed countries.



Source: Organization for Economic Co-operation and Development and the International Monetary Fund.

TABLE 5-2.—*Statutory Corporate Income Tax Rates, Depreciation Allowances, and Effective Marginal Tax Rates for Selected OECD Countries, 2005*

Country	Statutory Corporate Income Tax Rate (percent)	Discounted Value of Depreciation Allowance—Equipment (equity)	Effective Marginal Tax Rate Equipment (equity; percent)
Japan	40	73	28
United States	39	79	24
Germany	38	71	29
Italy	37	82	19
Canada	36	73	25
Spain	35	78	21
Belgium	34	75	22
France	34	77	20
Switzerland	34	78	20
Greece	32	87	12
Netherlands	32	73	21
Australia	30	66	24
United Kingdom	30	73	20
Norway	28	67	22
Portugal	28	79	15
Sweden	28	78	16
Finland	26	73	17
Austria	25	66	20
Ireland	13	66	10
Average (unweighted)	31	75	20
G-7 Average (unweighted)	36	76	24

Source: Institute for Fiscal Studies, Corporate Tax Database.

These lower tax rates have had many positive consequences for the economy. Lower taxes for individuals increased people's disposable income, allowing them to save more and spend more. Lower taxes for businesses increased business incentives to invest in new capital assets, which will improve worker productivity and wages and increase their international competitiveness. Letting tax relief expire will remove many of the gains made in each of these areas.

Fixing the Alternative Minimum Tax

The first minimum tax was enacted in 1969 in response to a Treasury Department report that a number of high-income taxpayers had no Federal income tax liability in 1966. The Alternative Minimum Tax, which is a parallel tax system with its own set of exemptions, deductions, and tax rates, was intended to ensure that high-income taxpayers pay their fair share of taxes. A major difference between the regular income tax laws and the AMT is that several significant deductions allowed under the regular income tax—such as personal exemptions, State and local income taxes, and business expenses—are not allowed under the AMT.

Technically, all taxpayers are required to compute their tax liability under both the regular income tax laws and the AMT and then pay the larger tax amount. Having to compute one's tax liability twice increases both compliance costs and the complexity of the tax code. In practice, the large income exemption available under the AMT means low-income taxpayers hardly ever owe more under the AMT. For many years, middle-income taxpayers were similarly unaffected by the AMT. However, the major problem with the AMT is that, unlike the regular tax exemptions and bracket thresholds, the AMT values are not indexed for inflation. This means that, as people's incomes naturally rise, even if only with inflation, an increasing number of middle-income taxpayers find themselves having a greater tax liability under the AMT than they do under the regular tax code. To counteract this problem, the exemption has been permanently increased several times, most recently in 1993, to $45,000 for joint returns and to $33,750 for singles. Above the exemption amount, the AMT tax rate is 26 percent on the first $175,000 of taxable income and 28 percent thereafter. (Adjusting for inflation, the $45,000 exemption in 1993 is worth more than $66,000 in 2008 dollars.)

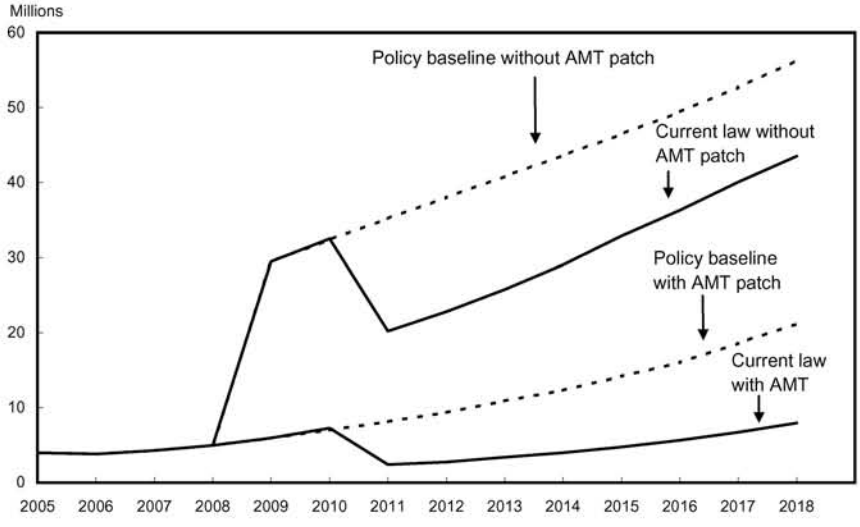
In its first year of operation, the minimum tax affected only 19,000 taxpayers and raised about $122 million, meaning this tax caused these taxpayers to owe $122 million more in tax than they owed under the regular tax laws. In 2007, the AMT affected over 4 million taxpayers and raised roughly $26 billion in revenue (about 1 percent of all Federal revenue). Under current law, these

numbers are projected to increase to over 29 million taxpayers and over $100 billion in revenue in 2009.

Chart 5-4 shows the number of taxpayers who are forecast to be affected by the AMT under different future policies. Under current law—with the AMT parameters returning to their 1993 levels after 2008 and tax relief expiring at the end of 2010—the number of AMT-affected taxpayers will rise sharply in 2009, ultimately reaching nearly 44 million taxpayers in 2018. In 2008, Congress enacted an AMT "patch," which adjusted the AMT parameters for 1 year to $69,950 for joint returns and $46,200 for singles (Congress has enacted short-term changes to the AMT parameters several times since 2001). If this patch is permanently extended and tax relief is allowed to expire at the end of 2010, the number of AMT-affected taxpayers would rise to 8 million in 2018. Alternately, if tax relief is extended (the "policy baseline" lines in Chart 5-4) the number of AMT-affected taxpayers will grow to 56 million in 2018 if the AMT parameters are allowed to return to their 1993 levels or to 21 million taxpayers if the AMT patch is permanently extended.

Taxpayers with many dependents or significant business deductions and those in high-tax States are more likely to be subject to the AMT. Three reductions to taxable income allowed under regular tax laws but not under the AMT are personal exemptions, miscellaneous business deductions, and State and local taxes. Taxpayers claiming more dependents may be accustomed to

Chart 5-4 **Number of Taxpayers Subject to the Alternative Minimum Tax**
The number of taxpayers affected by the AMT in the future depends on whether the AMT parameters are adjusted for inflation and on whether tax relief is allowed to expire after 2010 (current law) or is extended (policy baseline).



Note: Permanent patch at 2007 exemption levels.
Source: U.S. Department of the Treasury (Office of Tax Analysis).

seeing a large reduction in taxable income because of the personal exemption allowed for each dependent, but no corresponding reduction is available under the AMT. Similarly, miscellaneous business deductions, allowable under the regular tax laws when they exceed 2 percent of adjusted gross income (AGI), are not deductible under the AMT. Taxpayers in a State with relatively high income taxes or relatively high property taxes receive a relatively large deduction under the regular tax laws but receive no relief for this expense under the AMT. The result of these items not being deductible under the AMT is that people with these deductions are more likely to be subject to the AMT than are people without these deductions. Among otherwise similar people, taxpayers with these deductions generally still pay less in Federal income tax than do people without these deductions, but the existence of the AMT reduces the tax benefit these deductions provide and means these people will have the extra work of filling out the additional form(s) required for the AMT.

Prior to 1998, most personal credits (such as the education tax credits and the child and dependent care credit) could not be used to reduce tax liability owed under the AMT. In fact, even if a taxpayer did not owe additional tax under the AMT, he or she would be prohibited from using the full amount of a credit if it would reduce his or her tax liability below the level determined under the AMT. This reduction in credit usefulness was yet another way people could be "hit" by the AMT.

AMT Reform Ideas

The most obvious way to deal with the AMT would be to abolish it entirely, although this would require the Federal Government to forgo over $1.7 trillion in revenue over the next 10 years (assuming tax relief is extended through at least 2018). Short of that, there are several incremental approaches that could be used. One alternative would be for Congress to enact permanent inflation indexing of the AMT income exemption and other parameters. The recent experiences when 1-year increases in the AMT exemptions were enacted make clear that a permanent solution is needed. Other ways to reduce the impact of the AMT on the middle class include allowing deductions for personal exemptions and State and local taxes. Prohibiting taxpayers from using their personal exemptions under the AMT means the AMT treats large families differently than the regular tax code does, and effectively makes it more expensive for people to raise a family.

Simplifying the Tax Code

Finally, it remains difficult to overstate the complexity of the U.S. Internal Revenue Code: at standard print sizes, it would fill thousands of pages, with more added nearly every year. Deductions, exemptions, phase-outs, credits, and the AMT add complexity to the tax code that makes it challenging for

ordinary people to determine their tax liability. See Box 5-3 for a fuller discussion of these issues.

Box 5-3: Tax Code Complexity

The U.S. individual income tax system is extremely difficult to understand and, as a result, imposes a substantial burden on taxpayers in the form of time and money spent complying with its various rules. There are dozens of tax credits and deductions, many of which target specific social goals. As the number of credits and deductions has grown over the years, the number of overlapping provisions has also increased, which often creates complicated interactions among provisions. Further, eligibility can vary across similar tax preferences due to idiosyncratic definitions and complicated phase-out provisions intended to limit tax benefits to lower-income taxpayers. For example:

- The tax code currently contains a dozen special tax preferences relating to educational expenses. Three commonly utilized preferences—the Hope credit, the Lifetime Learning credit, and the tuition deduction—help families meet the costs of post-secondary education, but each provision varies in terms of eligibility and benefits. Also, the use of one tax provision may affect a student's ability to use one of the other provisions and can even affect a student's eligibility for subsidized student loans or Pell Grants.
- Phase-out provisions reduce the benefit of certain tax preferences (such as personal exemptions and the tuition deduction) for high-income taxpayers. Similarly, the maximum allowable amount of itemized deductions can be reduced for taxpayers with an AGI above $159,950 (in 2008). These provisions require additional calculations for taxpayers and also effectively increase their marginal tax rate. In 2008, an estimated 13 percent of taxpayers who itemized deductions will have their allowable itemized deductions reduced.
- When the parents of a qualifying child file separate tax returns, the tax code contains a number of special rules to determine which parent can claim the child as a dependent. These rules depend on the marital status and adjusted gross income of the parents as well as on the amount of time the child lives with each parent.
- To prevent parents from shifting investment income to their children, the unearned income of dependent filers is taxed at the parents' marginal tax rate. However, to limit this provision to higher-income families, this applies only to a child's unearned income in excess of a certain limit ($1,800 in 2008).
- As discussed in the text, the AMT, which requires taxpayers to calculate their tax liability a second time using a different set of tax rules and rates, affects a growing number of taxpayers.

Complying with these complex laws costs taxpayers time and money. It takes time to read and understand the laws, to collect the relevant data and keep records, and to fill in the forms themselves (or to have someone else do it). In fact, the tax laws are so complex that an entire industry of lawyers and accountants exists to help people comply with the laws and even to find ways to avoid paying the taxes they owe. The resources used in this industry are unavailable for use to produce other goods and services. In effect, other than for tax-related purposes, there are no consumable goods or services produced by these resources—one could argue that the economy is wasting these resources. Several studies have examined the social cost of the complexity of our tax code. A Government summary of these studies concludes that the annual cost of complying with the tax laws averages at least 1 percent of GDP (about $140 billion in 2008) and may be even higher. Tax reform that substantially simplified the tax code would free up these resources for more beneficial uses.

Conclusion

Taxes distort incentives to work, save, and invest. By lowering individual income tax rates at all income levels over the past 8 years, the Administration has substantially reduced these distortions and increased incentives to work, save, and invest. Lower Federal tax rates on capital gains and dividend income, along with the temporary increases in depreciation allowances, increased business incentives to purchase new capital equipment and reduced the double taxation of corporate income. Each of these changes improves the efficiency of the tax structure, enhances economic growth, and improves our standard of living over the long run. However, most of these tax reductions are scheduled to expire at the end of 2010, which would eliminate many of the gains made over the past 8 years. Allowing these tax reductions to expire will increase taxes for all income groups, with the lower- and middle-income groups experiencing the largest percentage increases.

Despite the improvements of the past 8 years, there remains much to be done to make the tax code as efficient as possible. In the international arena, the relatively low U.S. corporate tax rates of the late 1980s were left unchanged while most other developed countries dramatically reduced rates. As a result, U.S. corporate tax rates are now among the highest in the developed world. This handicap is partly offset by other tax provisions, such as generous depreciation allowances. But the resulting tax burden still places U.S. companies at a competitive disadvantage relative to companies in lower-tax jurisdictions, and it reduces our ability to attract capital in an environment where capital is highly mobile across international borders. In addition, two

long-standing problems needing attention are the Alternative Minimum Tax and the complexity of the U.S. income tax laws. Without its annual "patch," the AMT would affect more than 20 million more taxpayers each year.

CHAPTER 6

The Long-Run Challenges of Entitlement Spending

Federal spending on entitlement programs is expected to increase dramatically in the coming decades, particularly for Social Security, Medicare, and Medicaid. Taken together, these programs currently constitute 45 percent of Federal non-interest spending; assuming there are no major changes to these programs, this share is projected to rise dramatically in coming decades. An aging population and rising health care spending per person are major reasons for these projected increases. The primary objective of this chapter is to highlight the budgetary challenges facing each of the three major entitlement programs and to outline possible strategies for addressing these challenges.

The key points of this chapter are:

- Federal entitlement spending is on an unsustainable path. Spending on the three major entitlement programs—Social Security, Medicare, and Medicaid—is projected to increase much faster than tax revenues or than the overall economy over the coming decades. Paying all scheduled benefits would eventually require substantial reductions in other Government spending, or major tax increases, or both.
- The aging population is a major cause of the expected increase, especially for Social Security, representing a permanent, as opposed to temporary, shift in the entitlement landscape. Currently, one out of six adults is age 65 or older; by 2020, one out of five adults will be 65 or older; and, by 2030, one out of four adults will be age 65 or older.
- The pay-as-you-go financing structure of Social Security, coupled with the aging population, creates a sizeable structural imbalance that will cause current and future generations of workers to bear increasing costs, or receive smaller benefits than now scheduled, or both.
- Over the past 30 years, real per capita health care spending has grown considerably faster than real gross domestic product (GDP) per capita. Real growth in Medicare spending is being driven by increasing enrollment, greater utilization of more expensive high-technology medical treatments, and expansion of the goods and services covered by the program.
- Long-term care expenditures for low-income elderly and disabled persons represent a large and growing share of total Medicaid spending. The demand for long-term care is expected to grow in the United States as a result of the aging population. In turn, this will place even greater financial strain on Federal and State budgets.

Background Facts About Entitlement Programs

Social Security, Medicare, and Medicaid are key components of the U.S. social safety net. This section briefly reviews the evolution and current structure of each program.

Social Security

The Social Security system protects people from income loss due to life events such as retirement, a period of disability, or the death of a household wage earner. This system was introduced in 1935, when it is estimated that over half of the elderly lacked the income needed to care for themselves. In 2007, approximately 50 million beneficiaries received $585 billion in benefit payments. Approximately $486 billion of these benefits was paid to over 40 million retirees and survivors, and $99 billion was paid to 8.9 million disabled workers and their families. Nearly 90 percent of all individuals aged 65 and over received some benefit from Social Security in 2006 (the most recent year for which these data are available). Social Security benefits provided about 58 percent of all income received by individuals age 65 and older and for 32 percent of recipients, Social Security benefits provided over 90 percent of their entire income.

Social Security is largely a pay-as-you-go program, meaning that current benefits are financed primarily with a payroll tax on wages earned by current workers. Employers and employees each pay 6.2 percent of wages—although economists generally believe the employer's portion is passed on to workers in the form of lower wages—up to a maximum amount of taxable wages. This maximum, called the contribution and benefit base, increases each year as average wages increase; it was $102,000 in 2008, increasing to $106,800 in 2009. Self-employed individuals pay the entire 12.4 percent.

As a result of legislation enacted in 1983, Social Security began collecting more revenue than was needed to pay benefits each year, thereby requiring current workers to partially prefund future retirement benefits. The annual surpluses have been placed in the Social Security Trust Fund, which is invested in special U.S. Treasury bonds, used only for this purpose. In 2007, Social Security ran a surplus of $190 billion, which brought the balance in the Trust Fund to over $2.2 trillion. Because the value of the assets accumulated in the Trust Fund is exactly offset by the liability of the general fund to repay the special Treasury bonds, the Social Security Trust Fund has zero *net* value for the Government.

The Social Security benefit a worker receives in retirement is based on the average wage he or she earns when working and paying the Social Security payroll tax. Workers who earned higher wages get larger benefits, but the portion of preretirement income replaced by Social Security declines as

preretirement wage income rises. An individual must have worked and paid Social Security taxes for 40 quarters (10 years of employment) to be eligible for retirement benefits. Individuals become eligible for a reduced benefit at age 62, while those who work past full retirement age can receive a larger benefit for each year worked up to age 70. Once a retiree's initial benefit has been determined, it increases each year with annual cost-of-living adjustments that are based on the inflation rate for the previous year.

More than one in six recipients of Social Security benefits receive their benefits through the Disability Insurance program. This program provides monthly benefits to workers and their families for workers who are unable to work for a year or more. The Social Security Administration has guidelines about the conditions that must be met before an individual can receive this benefit.

Medicare

Beginning in the 1930s and for several subsequent decades, policymakers considered legislation that would create a larger role for Government in the provision of health insurance for Americans, particularly for those who faced financial barriers to medical care. Before Medicare was created in 1965, almost 50 percent of older adults lacked health insurance. Originally, only people age 65 and older were eligible for Medicare. In 1972, eligibility was expanded to include those receiving Social Security Disability Insurance payments for 2 consecutive years and those with end-stage renal disease who meet specific eligibility requirements. Today, nearly 45 million individuals are enrolled in Medicare, including approximately 38 million elderly and 7 million disabled beneficiaries.

Medicare has four parts:

- Part A, also known as Hospital Insurance, provides coverage for inpatient hospital services, some home health care, hospice, and up to 100 days in a skilled nursing facility after a qualifying inpatient stay. Individuals who have worked at least 40 quarters in qualified employment are automatically enrolled in Part A upon reaching age 65. Individuals who lack 40 quarters of employment can buy into Part A when they reach 65 years of age by paying a monthly premium (plus a late penalty if enrolling after the initial eligibility period); in 2009, the maximum monthly premium is $443.
- Part B provides coverage for outpatient services, including outpatient provider visits, emergency room services, and certain preventive screening measures. Enrollment in Part B is optional (there is a penalty for enrolling after the initial eligibility period) and requires a premium contribution, which is higher for individuals who make more than $85,000 per year, based on their most recent Federal income tax return.

- Part C, also called Medicare Advantage, uses private health plans to provide Part A and B and, in most cases, Part D benefits. Medicare Advantage plans often include benefits not covered by traditional Medicare. The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 changed how the Government reimburses health plans for the coverage they provide to enrollees. This resulted in an increase in the number of private plan choices available to beneficiaries in every county in America. Enrollment growth has been steady, most likely due to improved access to Medicare Advantage plans and more generous benefits. Current enrollment is nearly 10 million beneficiaries, representing over 20 percent of all Medicare beneficiaries.
- Part D, also created by the 2003 legislation, is an optional, outpatient prescription drug benefit. This benefit is administered by private health insurance plan sponsors that contract with the Federal Government. In 2008, 32 million Medicare beneficiaries were enrolled in stand-alone prescription drug plans, Medicare Advantage prescription drug plans, or employer/union plans receiving the Retiree Drug Subsidy.

Medicare is financed primarily through a combination of payroll taxes, general revenues, and premiums paid by beneficiaries. Part A is financed primarily by a dedicated payroll tax of 2.9 percent, which is split evenly between employees and employers. If total non-interest revenues exceed Medicare Part A spending for a particular year, the difference is placed into the Hospital Insurance Trust Fund. If non-interest revenues are lower than spending, money is withdrawn from the Hospital Insurance Trust Fund. At the end of 2007, the Hospital Insurance Trust Fund had a balance of $326 billion; however, under the Medicare Trustees' intermediate estimates, this balance is expected to begin declining in 2008.

Medicare Part B is financed by general revenues and beneficiary premiums, the latter of which are set to equal approximately 25 percent of total expected spending. Part D is also financed through beneficiary premiums and general revenues, as well as State payments for low-income beneficiaries who are also enrolled in Medicaid. Medicare Advantage (Part C) is not separately financed; rather, it is simply a vehicle for providing Part A, Part B, and typically Part D benefits. Projections by the Medicare Trustees indicate that in 2010, approximately 45 percent of non-interest income will come from payroll taxes, 39 percent from general revenues, 12 percent from beneficiary premiums, and the remainder from miscellaneous sources.

Medicaid

Medicaid provides medical assistance to low-income individuals, including children and parents in working families, children and adults with severe disabilities, and low-income Medicare beneficiaries, who are known as

"dual eligibles" because of their eligibility for both programs. The Federal and State Governments share responsibility for administering and funding Medicaid. For States to receive Federal funding, their Medicaid plans must cover specific populations, including children under the age of 6 and pregnant women whose family income is below 133 percent of the poverty level; school-age children (ages 6 to 18) with family income below 100 percent of the poverty level; parents with income below States' July 1996 welfare eligibility levels; and certain other low-income and disabled persons. In addition, with approval from the Centers for Medicare and Medicaid Services, States have the flexibility to expand Medicaid eligibility to other groups of individuals, including those whose incomes exceed the mandatory thresholds indicated above.

Medicaid programs cover a broad set of health care services, including inpatient and outpatient services, dental care, family planning, mental health, substance abuse treatment, home health care, and long-term care services. In 2007, Medicaid monthly enrollment averaged approximately 48.1 million people, including 23.5 million children.

Medicaid is jointly financed by the Federal Government and the States. The Federal Government's share of each State's Medicaid spending is based on the Federal Medical Assistance Percentage (FMAP), which is calculated using a formula that incorporates data on average per capita income for each State and for the United States as a whole for the most recent 3 years. The FMAP formula is designed to provide a larger Federal share of spending for States with lower per capita income relative to the national average, with Federal shares ranging from a minimum of 50 percent to a maximum of 83 percent. Overall, Federal Government expenditures on Medicaid account for approximately 57 percent of total annual Medicaid spending. Unlike Medicare, the Medicaid program does not have any dedicated revenue sources; rather, Federal expenditures come from the general fund of the Federal Government.

As part of the Balanced Budget Act of 1997, the State Children's Health Insurance Program (SCHIP) was created to provide health insurance to uninsured children under age 19 who live in low-income families that are not eligible for Medicaid. In 2007, more than 7 million children enrolled in SCHIP. States have significant flexibility in terms of their program design. In particular, they can implement SCHIP by expanding their existing Medicaid programs, creating separate programs, or using a combination of the two approaches. States that implement SCHIP as a Medicaid expansion must provide all of the benefits offered through their Medicaid programs, while States that choose to have separate SCHIP programs must provide benefits that meet specific Federal standards. Like Medicaid, the SCHIP program is financed jointly by the Federal Government and the States, although the Federal matching rate for SCHIP is higher than the rate used for Medicaid, and ranges from 65 percent to 83 percent of total spending.

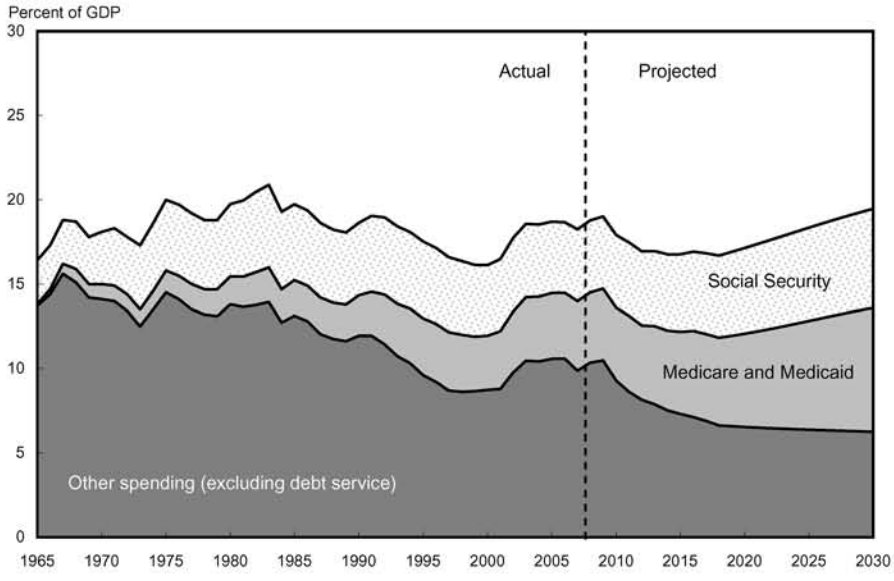
Unlike Medicaid, SCHIP is not actually an entitlement program, but is instead a matching grant program that has a fixed limit on Federal spending, both nationally and State by State.

Major Entitlement Spending Over Time

Federal Government expenditures for Social Security, Medicare, and Medicaid have grown from 3.8 percent of GDP in 1970 to roughly 8.4 percent of GDP in 2008. (For comparison, Federal revenue generated from all sources averaged 18.3 percent of GDP over the last several decades.) Estimates of expected future growth in entitlement spending consistently predict sharply rising expenditures in coming decades, although such projections depend on specific assumptions made for a variety of economic and demographic variables. The Office of Management and Budget (OMB) projects that in the absence of reforms, by 2020, spending on these three programs will exceed 10 percent of GDP; by 2040, it will reach 14.9 percent of GDP, and by 2080, it will reach 18.9 percent of GDP. It is important to note, however, that there is considerable uncertainty among long-run forecasts. For example, under its Alternative Fiscal Scenario, the Congressional Budget Office (CBO) projects that Federal spending will rise much faster, reaching 11.2 percent of GDP by 2020, 16.8 percent of GDP by 2040, and exceeding 25 percent of GDP by 2080. The primary difference between the OMB and CBO projections (and other projections) is in their forecasts of future health care expenditures; in contrast, their forecasts of Social Security growth are very similar. Chart 6-1 uses the OMB projections to contrast the projected growth in these programs with other Federal spending, which fell in the 1990s with declines in defense spending, rose with increased Homeland Security spending over the past few years, and is assumed to decline in the coming decades, primarily due to declines in defense and other discretionary spending. Two trends can be discerned from Chart 6-1. One trend is the growth in Social Security spending expected over the next two decades. In 2008, Social Security spending constituted approximately 4.3 percent of GDP. CBO estimates this share will grow to 6.1 percent of GDP by 2030, with OMB estimating growth to 5.9 percent of GDP by 2030. After 2030, the share of GDP spent on Social Security remains relatively constant under both forecasts. Population aging is the main cause of this growth, a factor that also affects Medicare costs.

The second trend shown in Chart 6-1 is that after the period of Social Security's rapid cost growth, health care expenditure growth will cause Medicare and Medicaid spending to grow far more over the long term. In 2008, Medicare and Medicaid respectively constituted 2.7 percent and 1.4 percent of GDP. CBO projects that, absent reforms, in 2030 these

Chart 6-1 **Expenditures as a Percent of GDP**
Social Security, Medicare, and Medicaid will all grow as a share of GDP over the next generation.



Source: Office of Management and Budget (2008)

shares will rise to 5.9 percent of GDP for Medicare and 2.5 percent of GDP for Medicaid. In comparison, OMB predicts that, absent reforms, in 2030 Medicare spending will be 5.0 percent of GDP and Medicaid spending will be 2.4 percent of GDP. By 2060, CBO projects spending for these programs will grow to 11.2 and 3.3 percent of GDP, respectively, while OMB projects spending will grow to 7.7 and 3.2 percent of GDP, respectively. Note that the major difference between the two forecasts lies in their estimates of the growth in health care expenditures per beneficiary.

Even under the more optimistic OMB projections, expected growth in entitlement spending will place a significant burden on the Federal budget and will require policymakers to make hard choices about the financing and benefit structures of these entitlement programs, as well as other Federal spending.

Social Security

During the program's first four decades, spending for Social Security benefits steadily increased relative to the size of the economy, reaching about 4 percent of GDP in the mid-1970s. This initial growth was driven largely by repeated program expansions that broadened coverage to include benefits for spouses and dependent children of retirees (1939), survivors of deceased workers (1939), the self-employed (1950), and disabled individuals (1956). Since then, annual spending for Social Security benefits has generally fluctuated between 4.1 percent and 4.5 percent of GDP.

As shown in Table 6-1, the number of Social Security beneficiaries is expected to more than double from 2000 to 2050, while the total population will increase by roughly 50 percent. The relative growth of the number of elderly individuals means that a larger share of the adult (age 18 and over) population will be drawing Social Security benefits in the years ahead. The demands imposed on the Social Security program by the baby boomers will diminish by the middle of the 21st century, but the expectation of a relatively constant fertility rate in combination with increasing lifespans means the portion of the adult population drawing Social Security benefits will remain high by historical standards. Box 6-1 describes some of the ways in which the Social Security program influences the saving behavior and labor supply decisions of individuals.

TABLE 6-1.—*Old-Age, Survivors, and Disability Insurance (OASDI) Benefits and Beneficiaries, 1950–2050*

Year	Benefits Paid (billions of dollars)	Percent of GDP	Beneficiaries (thousands of people)	Percent of Adult Population
1950	1.5	0.5	2,930	2.8
1975	68.7	4.2	31,123	20.9
2000	418.2	4.3	45,162	21.5
2025	1,814.1	5.7	77,138	28.3
2050	5,989.4	6.1	95,640	28.3

Source: Congressional Budget Office, Department of Commerce (Bureau of the Census and Bureau of Economic Analysis), and Social Security Administration.

Box 6-1: Undesirable Consequences of Social Security

The specific taxation and benefit structure of Social Security produces some undesirable consequences that may discourage participants from working and saving. Reduced work and saving levels reduce national output (GDP) and gradually reduce the U.S. standard of living over time from what it could have been. Efforts to reform Social Security should address each of these disincentives.

There are at least three ways Social Security discourages work and saving. First, the system imposes high effective tax rates on secondary earners. The benefit available to a married couple is either the sum of the benefits they are each individually eligible for or up to 150 percent of the higher earner's benefit, whichever is larger. This structure means the lower earner in a couple receives very little return on his or her Social

continued on the next page

Box 6-1 — continued

Security tax contributions and, if the low earner's wage is low enough, may not realize any benefit from his or her tax contributions. This reduces the reward for the second member of a married couple to work outside the home and can contribute to a decision not to participate in the labor force at all. As an extreme example, this can also cause the Social Security taxes paid by a low-income two-earner couple to subsidize the benefits received by a high-income one-earner couple.

Second, the program encourages early retirement. The existence of an Early Eligibility Age encourages workers to retire earlier than they may have done in the absence of Social Security. In fact, while the decision of when to retire probably depends on many factors, the mere existence of a sure income source in retirement, via Social Security benefits, could encourage people to retire earlier. The average age of retirement has been declining steadily, from over 67 in the early 1950s to under 63 in the early 2000s. When workers retire early, they pay less tax into Social Security and draw benefits for a longer period of time. This provision thus places additional stresses on Social Security finances and reduces the total amount of labor supplied to the economy.

Few people work past normal retirement age, perhaps because, in terms of one's Social Security benefit, the return to working past normal retirement age is modest at best. While a person who delays taking Social Security benefits receives a larger monthly benefit, they receive this benefit for a shorter period of time. The actuarial present value of the deferred payments is almost identical to the value of the payments that could be taken at normal retirement age. When one considers the additional taxes a person pays on labor income earned after normal retirement age, the return to working after this age may even be negative. This provides little incentive for people to work past their normal retirement age.

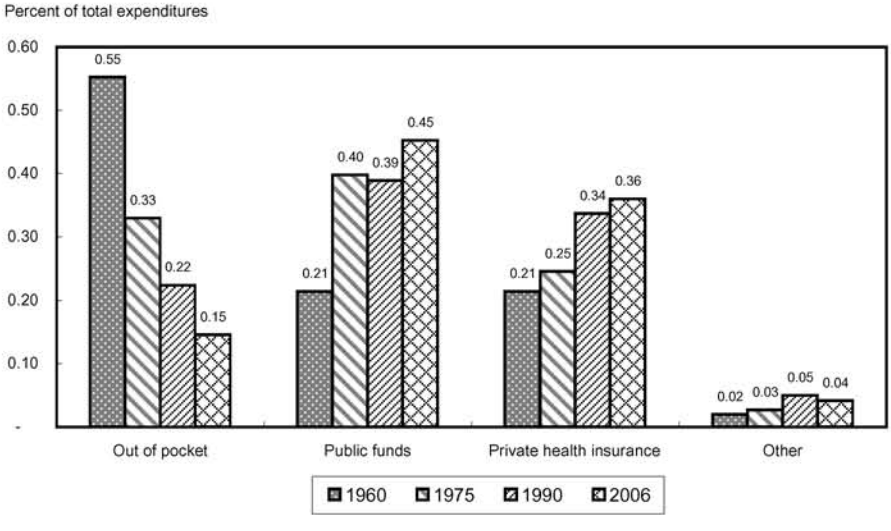
Third, Social Security discourages private saving. Social Security is a system that effectively forces people to save for their retirement—a portion of their wage is taken away and, in return, they expect income during retirement. From the perspective of an individual planning for his or her retirement, it makes little difference whether this income comes from a government program or from his or her own investments. However, when individuals do their own saving, the money is used by the financial markets to expand the economy. With a pay-as-you-go Social Security system, the taxes collected today are used to pay benefits for current retirees, and no actual saving occurs in terms of money going into financial markets. This means that a pay-as-you-go Social Security system actually reduces economy-wide saving, which reduces economic growth from what it could have been.

Medicare and Medicaid

Public spending on health care has increased as a share of total U.S. personal health care expenditures over the past several decades, as shown in Chart 6-2. In 1960, only 21 percent of personal health care spending was paid for by Federal and State Governments. With the introduction of Medicare and Medicaid in 1965, and SCHIP in 1997, public spending as a share of total health care spending has more than doubled to 45 percent. In contrast, the share of personal health care spending that is paid out of pocket by individuals has fallen dramatically from 55 percent in 1960 to just 15 percent of total spending in 2006.

Medicare expenditures, which include benefit payments and administrative expenses, were $432 billion, or approximately $10,500 per enrollee, in 2007. Between 1980 and 2006, real Medicare spending, that is, spending adjusted for the effects of inflation, grew at an average annual rate of 6.4 percent. This rate is higher than the 3.1 percent average annual growth rate for real GDP during that period. From 2008 to 2017, the Medicare Trustees' intermediate projections, which take into account currently legislated reductions in physician payment rates, suggest real Medicare spending will grow at an average rate of 6.0 percent per year. This rate exceeds projected average real economic growth of 2.8 percent per year over the same period.

Chart 6-2 **Changes in Source of Funds for Personal Health Care Expenditures**
The share of health care expenditures paid out of pocket by individuals has declined, while the shares paid by the Government and private insurers have increased.

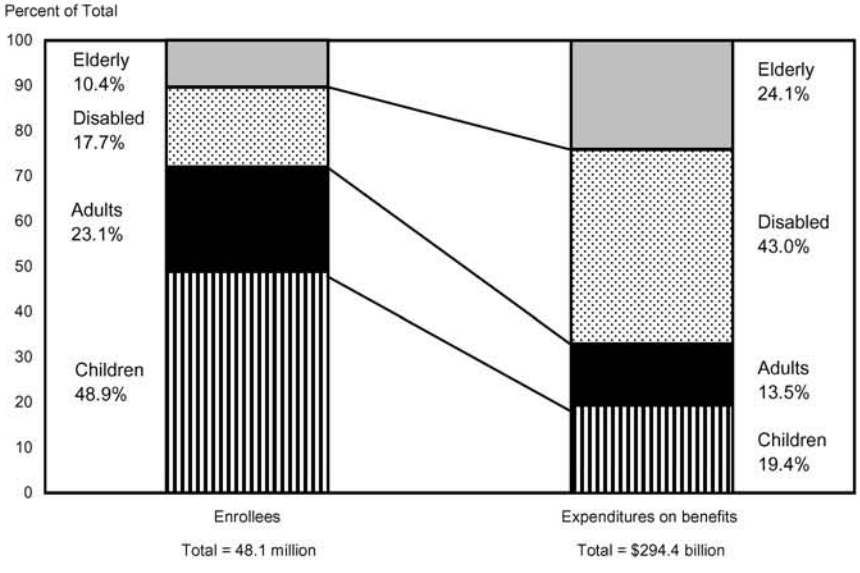


Source: National Health Expenditures Data, Department of Health and Human Services (Centers for Medicare and Medicaid Services).

Government spending on Medicaid and SCHIP includes benefit payments, administrative expenses, and payments for the Vaccines for Children program. Collectively, the Federal Government and States spent $352 billion on Medicaid and an additional $10 billion on SCHIP in 2008. Of this total, Federal spending was approximately $190 billion for Medicaid and $7 billion for SCHIP. The amount spent on different Medicaid enrollee groups varies considerably. While the elderly and disabled represent the smallest groups in terms of numbers of enrollees (28.1 percent), they account for over 67 percent of spending, as depicted in Chart 6-3. (See Box 6-2 for a discussion of Medicaid and long-term care expenditures.) In contrast, children are much less expensive to cover. In 2007, almost half of total Medicaid enrollees were children, and yet they generated less than 20 percent of total spending.

Between 1997 and 2007, real Federal Medicaid spending grew at an average of 3.5 percent per year. This growth reflects a number of factors, including increased enrollment from outreach efforts and eligibility expansions, increased use of high-technology services (such as advanced diagnostic imaging and prescription drugs), and greater reliance on Medicaid to cover long-term care expenses. Medicaid spending is expected to continue growing faster in real terms than the overall economy throughout the coming decade.

Chart 6-3 **Medicaid Enrollees and Expenditures by Enrollment Group, 2007**
The elderly and disabled comprise 28.1% of Medicaid enrollees and 67.1% of Medicaid expenditures.



Source: Department of Health and Human Services (Centers for Medicare and Medicaid Services) 2008 Actuarial Report on the Financial Outlook for Medicaid.

Box 6-2: Long-Term Care and Medicaid

Today, about 10 million Americans receive long-term care services. Long-term care refers to medical care and support required by someone with a chronic illness or disability over an extended period of time. Typical long-term care services range from providing assistance with eating, bathing, and dressing, to managing medications and preparing food. Most people who require long-term care are 65 years of age or older. This demographic cohort is projected to grow dramatically over the next several decades, greatly increasing demand for long-term care services.

Current estimates suggest the average cost of nursing home care is $68,000 per year, an amount high enough to strain most families' finances. Private long-term care insurance represents one way individuals can obtain financial protection from these costs. Yet most people do not purchase long-term care insurance.

In 2005, Medicaid expenditures for long-term care services were $101 billion, representing 49 percent of the Nation's spending on long-term care. Under Federal law, State Medicaid programs must cover nursing home care and home health care, and may opt to cover some personal care services as well for qualified individuals. In contrast, Medicare covers only some home health care and limited recuperative care in skilled nursing facilities following a qualified inpatient hospitalization. In 2005, Medicare's share of total U.S. long-term care spending was approximately 20 percent.

Medicaid expenditures have grown rapidly in recent years with the increasing cost of covering long-term care and a growing population of elderly and disabled people. Medicaid expenditures on long-term care, including skilled nursing care as well as home- and community-based services, are expected to grow at an average real rate of approximately 6 percent per year over the next decade. By 2017, Medicaid long-term care expenditures for the Federal Government and States are projected to reach $228 billion. In the absence of fundamental reforms, this enormous entitlement burden will severely strain both Federal and State budgets.

Factors That Drive Expenditure Growth Over Time

Growth in expenditures for Social Security is expected to accelerate as the baby-boom generation retires, after which it is expected to level off. In contrast, expenditures for Medicare and Medicaid are expected to continue rising faster than GDP. This section examines the main factors that drive these expected increases in expenditures.

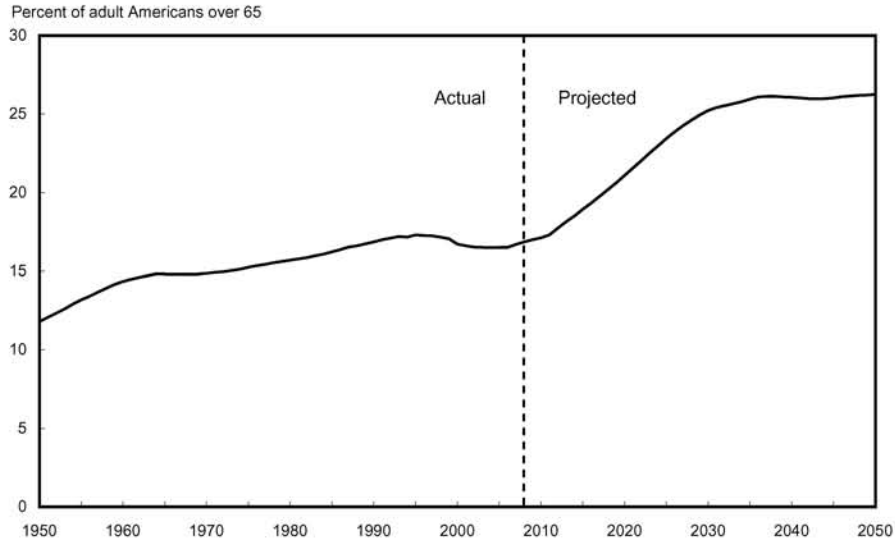
Demographic Shifts

The changing demographics of the United States population is an important factor in the growth of entitlement spending. With slowing birth rates and increasing life expectancy, the U.S. population is aging. For example, in 1950, less than 12 percent of the adult population was 65 or older; in 2008 this group constituted nearly 17 percent of the adult population. Demographers estimate that this trend will continue and that by 2030, twenty-five percent of the adult population—72 million people—will be at least 65 years of age.

This demographic shift means there are fewer workers paying taxes into the Social Security system for each retired person. To illustrate, in 1950, there were 16 workers paying taxes into the Social Security system for each Social Security beneficiary, meaning the effective tax burden on each worker was only one-sixteenth of the average amount paid to each beneficiary. In 2007, there were 3.3 workers per beneficiary. The number of workers per beneficiary is expected to fall further, to 2.6 workers per beneficiary in 2020 and to 2.1 workers per beneficiary in 2035. As the number of workers per beneficiary falls, the effective individual burden of taxes for both Social Security and Medicare Part A increases. For example, for Social Security, the payroll tax rate has been raised more than 20 times and the maximum annual amount of taxable income has been increased statutorily 11 times since the program's inception. This maximum is now (since 1981) adjusted annually to reflect average wage growth.

It is important to note that the demographic shift is not a temporary phenomenon brought on simply by the aging of the baby-boom generation. That is, assuming stable fertility rates and immigration patterns, one should not expect to return to a world with 16 workers—or even 5—contributing to each Social Security recipient's benefit after the baby-boom generation stops collecting Social Security benefits. Chart 6-4 shows that in the very near future, as the baby boomers retire en masse, the share of the adult population that is eligible for Social Security and Medicare will begin shifting from a recent average of about 16 percent to over 25 percent, where it will stay for the foreseeable future.

Chart 6-4 **The Population Age 65 or Older as a Percentage of the Total Adult Population**
The share of the U.S. adult population age 65 or older will increase from about 16 percent to over 25 percent over the next two decades.



Source: Department of Commerce (Bureau of the Census).

A clear implication of this trend is that there will be fewer workers to pay taxes to support each Social Security and Medicare recipient.

Increased Health Care Spending per Beneficiary

Advances in medicine over the past few decades have created new methods for diagnosing illness and disease, as well as new therapies for preventing and treating medical conditions. While these advances have contributed to improvements in quality of life and longer life expectancy, they also have contributed to greater utilization of complex, expensive treatments and higher spending per person. This phenomenon is not restricted to Medicare and Medicaid enrollees, but instead reflects broader health spending patterns among individuals in the United States.

Although health insurance, including Medicare and Medicaid, provides important financial protections, one consequence of comprehensive coverage and a third-party payment system is that individuals have little incentive to consider providers' costs when making decisions about the medical care they receive. This moral hazard effect can lead people to demand more medical care than they would without insurance because their out-of-pocket cost at the point of use constitutes only a small portion of the total cost of the service.

Among Medicare enrollees, moral hazard problems are exacerbated by the widespread use of supplemental insurance, including retiree coverage, private

Medigap plans, and Medicaid (for dual eligibles). In effect, the combination of Medicare and supplemental insurance means enrollees pay only a very small portion or none of the total cost of care, and as a result, price is removed as a factor in determining how much medical care enrollees consume.

The Bottom Line

The permanent demographic shift and growth in per-person health care spending suggest that there are two distinct aspects of these programs that must be addressed. One aspect is program solvency: that is, how will the Government finance the benefits scheduled to be paid over the near term to current and future beneficiaries? Given the permanent nature of the demographic shift and the likelihood that future health care expenditures will grow, it will be impossible for the Government to continue these entitlement programs indefinitely as they currently exist. Thus, the second aspect that must be addressed is the long-term sustainability of the programs.

The Financial Future of Social Security

The demographic transition to an older population that is already underway in the United States will place increasing stress on the financing of Social Security in the years ahead. This section examines the issues inherent in ensuring that benefits can be paid in the near term (solvency) and the issues that must be addressed to ensure long-term sustainability of this important program.

Addressing Future Solvency

Projections by the Social Security Administration (SSA) indicate that payroll tax revenues will exceed expenses through 2016, then, beginning in 2017, it will be necessary to draw on Social Security Trust Fund assets to pay all scheduled benefits. This would require making increasing amounts of general revenue available from 2017–2041 to pay full scheduled benefits, after which time the trust fund would be exhausted. Payroll tax revenues are projected to be sufficient to pay 78 percent of scheduled benefits in 2041 and beyond.

As Social Security costs continue to rise faster than revenues, increasing pressure will be placed on the general fund of the Federal Government. By purchasing Treasury bonds with its annual surpluses, the Social Security Trust Fund has been effectively lending money to the general fund of the Federal Government. As Social Security's annual surpluses decline, beginning after 2009, less money will be available to the Treasury Department from this channel and the Government will increasingly be forced to find other revenue

sources or reduce spending. The problems for the Federal budget intensify in 2017, when Social Security will first need money *from* the general fund to pay scheduled benefits. During the 2020s, Social Security will require larger and larger transfers from the general fund as it redeems the Treasury bonds that have accumulated in the trust fund, putting greater and greater pressure on the Federal budget.

Most proposed solutions to the solvency issue involve some form of revenue increases, or benefit reductions, or both. Social Security revenues could be increased either by raising the payroll tax rate or increasing the maximum amount of taxable earnings. However, as discussed in the preceding chapter, imposing taxes distorts markets—higher taxes would decrease economic efficiency by worsening the adverse labor incentives discussed in Box 6-1.

There are a variety of ways Social Security benefits could be reduced, such as further delaying the normal retirement age, or reducing scheduled benefits, particularly for higher-income workers. To help address the solvency issue, the President embraced the concept of progressive price indexing for new retirees. Progressive price indexing would reduce the growth in initial benefits for new retirees, particularly for high-income workers, and thus would reduce projected program costs in the decades ahead, while retaining currently scheduled benefits for very low income workers.

Workers with higher preretirement earnings are eligible for a larger initial benefit, but the marginal increase in the initial benefit decreases as a worker's preretirement income gets higher and higher. Progressive price indexing would further reduce the rate at which benefits grow with preretirement income, which would slow the year-by-year growth of initial benefits for high- and middle-income retirees. This proposal would ensure that retirees of the future will receive real benefits that are at least as high as those of today's retirees who are at comparable positions on the wage spectrum. Benefits for all recipients would still increase annually via cost-of-living adjustments to maintain the purchasing power of the benefits. Note that the current benefit formula would be preserved for individuals with low preretirement income. Estimates suggest that progressive price indexing would cover about 70 percent of the gap between income and outlays over the long term. Benefits paid under the Disability Insurance program would not be affected by this proposal.

Funding Future Benefits

The current Social Security system was designed in an era in which average life expectancy was less than 65 years and few women participated in the labor force. Today, average life expectancy is 78 years and about 60 percent of all women participate in the labor force. The demographic and labor market

changes that have occurred in the last 70 years or so render the pay-as-you-go system of the 1930s inappropriate for the 21st century.

A central feature of the Administration's 2005 proposals for Social Security reform, the Personal Retirement Account (PRA), was designed to pre-fund a portion of future benefit obligations. Participation in PRAs would be entirely voluntary. Workers could choose to have up to 4 percentage points of their current Social Security taxes go into their own, individual account. The Federal Government would administer these accounts, making contributions and withdrawals as appropriate for each worker's wages and individual choices.

Each worker could choose to have the funds in their account invested in any of a set of prescreened, broadly diversified investment funds, similar to those currently available to Government employees in their retirement savings plan. Recent stock market declines raise concerns about the desirability of investing even a portion of Social Security assets in the stock market. However, market declines, like market increases, are a normal part of stock market behavior and do not negate the desirability of owning stocks as part of a long-term investment strategy. From 1926 to 2000, even with several periods of significant market decline, stocks generated an average annual return of 10.7 percent.

Nevertheless, there is currently much concern about the risks of investing Social Security assets in the stock market. One way to mitigate these risks could occur automatically; as workers near retirement age, their PRA investments could be moved to lower-risk, life-cycle funds, which ensure the safety of the worker's retirement benefits by progressively shifting more of the worker's investment from growth funds to secure bonds as the worker nears retirement age.

A PRA-based system offers a partially self-funded retirement benefit while retaining the social safety net aspects of the current system. A primary advantage of this system would be significantly reduced intergenerational transfers from future workers entering the system. This system would give workers a partial alternative to the current, pay-as-you-go, Social Security system that, as discussed above, will require reducing benefits when the Social Security Trust Fund is exhausted or force workers to bear ever-increasing tax burdens as the population continues to age.

PRAs could be phased in to ensure that current retirees and workers nearing retirement would receive the full Social Security benefits they are expecting. PRAs would offer those who want it individual ownership and management of retirement assets and could be transferable to family members if the worker were to die prematurely. Finally, PRAs would reduce the disincentives the current system generates regarding labor supply and saving decisions. (Box 6-1 describes the disincentives present in the current system.) For example, PRAs reduce possible adverse labor supply effects for secondary earners by giving them explicit rights to a portion of their Social Security assets.

The Financial Future of Medicare and Medicaid

Medicare and Medicaid are currently responsible for purchasing health care services for over 80 million individuals in the United States annually—a number that is expected to exceed 100 million by 2017. This section takes a closer look at the future budgetary impact of these programs and identifies possible strategies for promoting long-term sustainability of Medicare and Medicaid.

Recall that Medicare is financed predominately by payroll taxes, general revenues, and beneficiary premiums. Under current projections in the 2008 Medicare Trustees Report, the Medicare Hospital Insurance Trust Fund for Part A is projected to be exhausted in 2019. The projected 75-year deficit for the Medicare Hospital Insurance Trust Fund is 3.54 percent of taxable payroll. That is, the Medicare Hospital Insurance payroll tax would have to immediately increase from a total of 2.90 percent to 6.44 percent to cover all projected spending for Part A over the next 75 years. Thus, one option for keeping Part A solvent would be to more than double the Medicare payroll tax rate. For Medicare Parts B and D, as well as Medicaid, general revenues are the largest source of financing. This suggests that, in the absence of significant reforms to slow spending growth, spending on other government programs will have to be dramatically reduced, budget deficits will grow larger, or income taxes will have to increase.

Real spending growth for Medicare and Medicaid is on a much steeper trajectory than projected growth for the economy as a whole. The long-term sustainability of these programs is in question unless policymakers implement a comprehensive set of reforms to slow both the overall growth in health care spending as well as the Federal Government's liabilities. Although key stakeholders have not yet discovered a silver bullet for slowing overall spending growth, insurers and providers are pursuing a variety of approaches in an attempt to improve the efficiency of resource allocation and to slow the growth of costs.

Some of these efforts focus on greater use of high-value health care services by individuals, including preventive care (certain types of screening for diseases), wellness initiatives (flu shots or smoking cessation advice), and disease management for those with chronic conditions. Other efforts target provider behavior, including adopting health information technology that may reduce medical errors and duplication of services, and participating in quality-measurement activities and public reporting. In value-based purchasing, insurers design payment systems that are tied more directly to the quality and efficiency of care that is delivered by providers. One example includes pay-for-performance programs, whereby providers may receive financial rewards if the quality of care they provide achieves certain outcomes (such as a physician

making sure that all of his diabetic patients receive HbA1c tests during the year) or if a provider shows improvement over time in the quality of care he or she provides. Of course, many of these initiatives are fairly recent and as a result, the empirical evidence is not yet available to establish what impact these particular initiatives might have for slowing overall cost growth.

A second strategy directly targets Federal spending growth vis-à-vis structural changes to the designs of the Medicare and Medicaid programs. Several types of reform proposals are specifically aimed to reduce Federal spending by altering the current structure of Medicare benefits. Increasing the age of eligibility for Medicare, raising premiums, and modifying the benefit design are three examples. Similar to the changes that were made to Social Security in 1983, the age at which individuals become eligible for Medicare could gradually increase. However, unlike Social Security, the savings generated from delaying eligibility may not be substantial, since younger Medicare beneficiaries have much lower average costs relative to older beneficiaries.

Beneficiary premiums are an important source of income for Medicare Parts B and D. Raising beneficiary premiums is one option for reducing Federal spending, although raising premiums for all beneficiaries may impose a significant financial burden on lower-income beneficiaries who are not also eligible for Medicaid. One suggested proposal calls for the broader use of income-related premiums, whereby higher-income beneficiaries would pay more for their coverage. Income-related premiums are already being used for Part B; however, as of 2007 the threshold was set so high that it affected less than 3 percent of the Medicare population. Using more stringent thresholds and adopting income-related premiums for Medicare Part D are two possible strategies for reducing the implicit subsidy that Medicare provides to higher-income beneficiaries.

Modifying the benefit design offers another approach to limiting Federal spending. Benefit design features, such as deductibles and coinsurance, are typically used to address moral hazard concerns. While increasing deductibles and coinsurance can reduce beneficiaries' incentives to overuse care and reduce spending, it may lead some beneficiaries to delay or forgo needed care due to cost. A related issue is the widespread use of supplemental Medicare insurance, which typically reimburses beneficiaries for deductibles and coinsurance amounts when they seek care. With this additional coverage, the price of medical care is effectively removed as a factor from decision making. Some economists have suggested that private supplemental Medicare insurance should be limited or eliminated altogether. Since greater utilization of high-technology treatments is a major driver of health care spending growth, an additional strategy is to base coverage decisions about new medical treatments on their comparative effectiveness and cost effectiveness relative to existing therapies. Certainly, this may raise concerns by patients and

providers regarding the role of government in determining which medical treatments are prescribed.

In addition to strategies that alter the existing program structure, others have suggested more fundamental changes to promote long-run sustainability. For example, some have suggested moving completely to a market-based approach in which Medicare beneficiaries receive risk-adjusted and income-adjusted vouchers that could be applied toward the cost of private health plans. Such a reform could build upon the strengths of the current Medicare Advantage program and potentially strengthen competition in the market for health insurance. Moreover, a voucher system would provide greater certainty in terms of the Federal Government's future liabilities.

Medicare provider payment systems are complex and generally create poor incentives for limiting spending growth. Fee-for-service payment systems reward providers for how much they do rather than for the value that they provide to Medicare patients. Furthermore, administrative pricing may or may not necessarily reflect what would be observed in a competitive market, due to inflation and technological advances in medicine. Competitive bidding has been proposed as one alternative method for setting prices. Specifically, competitive bidding requires providers to submit bids that reflect costs plus a normal rate of profit. Providers with the lowest cost can be identified. Over time, this type of system can enable providers to more easily adjust prices to reflect changes in production costs resulting from changes in input prices (such as the wages of nurses) or technology (such as MRI or CT scanners).

For Medicaid, one of the most pressing issues is the anticipated growth in long-term care. While some people require the level of care provided by nursing homes, many eligible Medicaid beneficiaries would actually prefer less expensive community-based care. Transitioning away from primarily institutional care and toward a more community-based long-term care system is one potential cost-saving measure; however, it is not clear to what extent overall demand for services will rise when access to this option improves. Encouraging the purchase of private long-term care insurance through tax credits or Qualified State Long-Term Care Partnerships, which protect some assets of those with long-term care insurance while still allowing them to qualify for Medicaid, may both reduce the spending burden on Medicaid and protect many seniors from poverty. Additionally, better coordination of care between Medicare, which is often responsible for financing initial nursing home stays through its post-acute care coverage, and Medicaid, which often assumes responsibility for nursing home patients after their Medicare benefits end, could also help reduce costs.

Conclusion

There are no painless solutions to the budgetary challenges arising from long-term projected growth in Social Security, Medicare, and Medicaid. While there is no specific year when one can be sure a crisis is imminent, it is clear that these problems will only grow larger the longer policymakers delay in developing and implementing reform strategies. The environments in which Social Security, Medicare, and Medicaid were created no longer exist, and the Legislative and Executive branches of the Federal and State Governments need to take up the budgetary challenges entitlement programs present and ensure that these programs are adapted to their new realities.

CHAPTER 7

Balancing Private and Public Roles in Health Care

Health care is one of the largest and fastest growing sectors of the U.S. economy, employing millions of individuals in hospitals, physician offices, home health agencies, long-term care facilities, insurance, and pharmaceutical and medical device companies. Today, Americans are living longer as a result of public health improvements and advances in medical treatment. While modern health care provides substantial benefits, there are growing concerns about its rising cost. In 2008, the United States is projected to spend approximately $2.4 trillion, or almost $8,000 per person, on health care, and forecasts indicate that spending will continue to grow at a rate faster than the gross domestic product (GDP). Recognizing that rising costs pose a threat to Americans' access to health insurance and medical care, the Administration has pursued several initiatives to encourage the efficient provision of health care through private markets and to improve access to affordable health care for individuals in the United States.

This chapter begins with a brief overview of U.S. performance with respect to the population's health status and spending on health care. This is followed by a discussion of key efforts by the Administration to address issues of health care quality, cost, and access. The key points of this chapter are:

- Health care spending is expected to grow rapidly over the next several decades, a trend that is driven by the increased use of high-technology medical procedures, comprehensive health insurance that decreases consumer incentives to shop for cost-effective care, rising rates of chronic disease, and the aging of the population in the United States.
- Markets for health care services can function more efficiently when payers, providers, and consumers have more complete information as well as incentives to use medical care that is clinically effective and of high value.
- Health insurance improves individuals' well-being by providing financial protection against uncertain medical costs and by improving access to care. Market-based approaches and innovative benefit designs can enable people to select coverage that best fits their preferences and to more actively participate in their own health care decision making.
- The Federal Government has an important role in investing in public health infrastructure, particularly with respect to improving the availability of community-based health care for the underserved, preparing for possible public health crises, supporting health-related research and development, and promoting global health improvement.

The Health of the U.S. Population

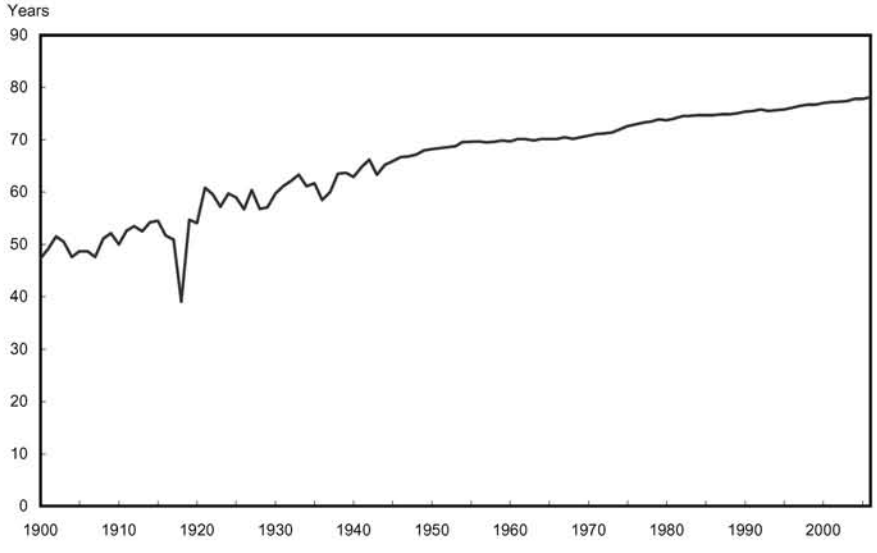
Health can be defined as a state of complete physical, mental, and social well-being. Individuals who are healthy are more productive and happier. Genetic factors; the environment; lifestyle behaviors such as smoking, eating healthy foods, and exercise; and medical care consumption are all factors that have been shown to affect an individual's health.

There are several different ways to measure health outcomes for a population. One consistent and reliable measure is life expectancy, defined as the average number of years of life remaining to a person at a particular age. Chart 7-1 shows how U.S. life expectancy at birth has changed over the past century. In the early part of the 20th century, life expectancy averaged 51 years until an influenza pandemic in 1918 resulted in a significant drop, to 39 years. Following that crisis, there have been steady increases in life expectancy over time. This positive trend can be explained by several factors, most notably, public health improvements such as cleaner water, improved sanitation, and vaccinations, as well as medical innovation.

A second way to measure population health is by examining disease prevalence. Rising rates of age-adjusted chronic diseases, which are conditions

Chart 7-1 **Life Expectancy at Birth**

Life expectancy at birth has increased over time.

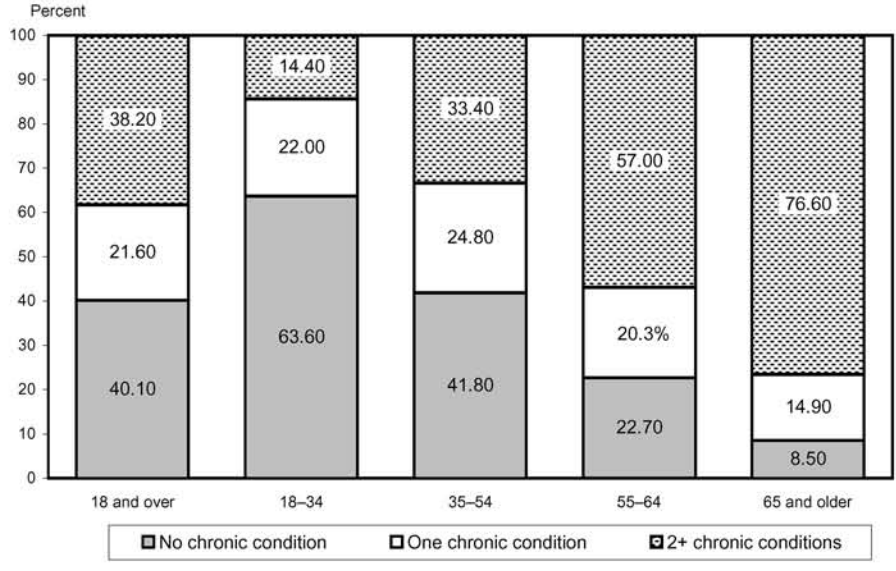


Note: Data from before 1929 are only from states that recorded death statistics.
Source: Centers for Disease Control.

expected to last at least 1 year, are particularly concerning to the medical, public health, and health policy communities. Heart disease and diabetes are two examples of chronic diseases that afflict millions of Americans each year. Heart disease, which affects 7.3 percent of adults 20 years of age and older, has been the leading cause of death for the past 90 years, as well as a major cause of disability. Diabetes affects 7.8 percent of the population, or roughly 23.6 million children and adults, and has numerous costly complications, including kidney damage, eye problems, nerve damage, foot problems, and depression.

In 2005, approximately 60 percent of people 18 years of age and older in the United States had at least one chronic condition, and older adults were considerably more likely to have multiple chronic conditions (Chart 7-2). Managing many chronic diseases can be quite costly. More than 50 percent of total medical care expenditures generated by the adult U.S. population (excluding expenditures for dental care and medical equipment and services) is for the treatment of chronic conditions. However, with medical management and lifestyle changes, people can remain productive and lower their risk of disability from these conditions.

Chart 7-2 **Distribution of Adults by Age Group According to Number of Chronic Conditions, 2005**
Chronic conditions are more prevalent among older people.



Source: Center for Financing, Access, and Cost Trends, AHRQ, Medical Expenditure Panel Survey, Statistical Brief #203: Health Care Expenses for Adults with Chronic Conditions, 2005.

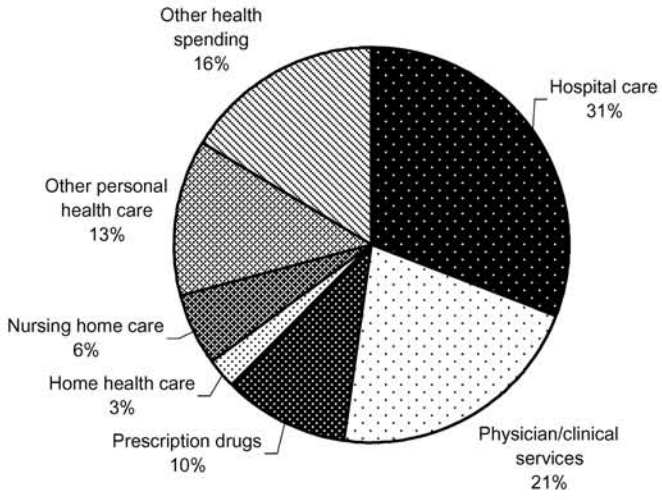
The good news is that many chronic diseases are preventable. Healthy lifestyle decisions, such as being a nonsmoker, eating nutritious foods, and getting regular physical activity, can significantly lower the likelihood of developing a wide variety of serious medical conditions. In the United States, the rate of smoking has fallen during the past several decades, a trend partially explained by better information about the associated health risks, as well as public policies that deter smoking behavior. However, a major health concern remains in that about 20 percent of adults still report being current smokers. Another major public health concern is the rapid rise in obesity rates among adults and children. Currently, more than 72 million people ages 20 and older are obese, which is defined as having a body mass index (a measure using information on a person's weight and height to indicate body fat) greater than or equal to 30. Obesity is a known risk factor for several costly medical conditions, including heart disease, diabetes, stroke, and some forms of cancer. Continued efforts to promote healthy eating and regular physical activity are critical for reversing this rising trend.

U.S. Health Care Spending

Health-related goods and services include hospital care, physician and clinical services, nursing home care, prescription drugs, and more. Over time, there have been large spending increases across all of these major categories. Chart 7-3 shows the distribution of national health expenditures by type of service in 2006, the most recent year of data available. Hospital care represents the largest segment, at 31 percent of total expenditures, followed by physician and clinical services (21 percent), other types of health spending (which include administration, the net cost of health insurance, public health activity, and research (16 percent)), other personal health care costs such as dental care and medical equipment (13 percent), and prescription drugs (10 percent).

U.S. health care expenditures have grown rapidly during the past several decades. In 2008, the United States is projected to spend approximately $2.4 trillion, or 16.6 percent of GDP, on health care. Based on actuarial estimates from the Centers for Medicare and Medicaid Services, forecasts indicate that by 2017, the United States will spend approximately $10,592 per person (in 2008 dollars), which corresponds to 19.5 percent of GDP. Spending a larger share of GDP on health care costs is not necessarily bad; it is to be expected as a nation's wealth rises. In addition to income effects, there are several other factors that drive up the cost of health care in the United States, including population aging, increases in input prices that are greater than inflation, technological advances, and third-party payment.

Chart 7-3 **Distribution of National Health Expenditures by Type of Service, 2006**
Approximately 50% of national health care expenditures are for hospital care and physician services.



Note: "Other personal health care" includes dental and other professional health services and durable and non-durable medical equipment. "Other health spending" includes administration and net cost of private health insurance, public health activity, research, and structures and equipment.
Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group.

Researchers who have investigated the catalysts of health care spending growth suggest that third-party payment and advances in medical technology can account for a significant proportion of the long-term, historical spending trends. Although health insurance provides valuable financial protection, benefit designs that have low out-of-pocket costs at the point of use (such as doctor or hospital visits) greatly inhibit consumers' incentives to search for the lowest-priced providers or to engage providers in discussion about alternative treatment options and their respective costs. Health insurance that has low out-of-pocket cost-sharing can also create distorted incentives regarding the development and diffusion of new medical technologies. Of course, many advances in medicine have been instrumental in helping Americans live longer and healthier lives. For example, providers now have more advanced technologies to diagnose specific problems (such as MRI or CT scanners), treat existing ailments (such as using minimally invasive surgical procedures), and prevent the onset and spread of new diseases or illnesses (such as use of vaccinations or screening procedures). However, when providers and consumers lack strong incentives to control spending, one potential result is that new, more expensive technologies may be prescribed and received, even if they are only slightly more effective than existing therapies. As the amount of financial resources allocated to health care rises, it is important to consider

the role that incentives play in determining the quantity and types of medical care that consumers receive. Additionally, it will be important to continue evaluating the extent to which greater utilization of medical services, including high-technology treatments, translates into better health outcomes.

Improving the Effectiveness and Efficiency of Health Care

The terms "effectiveness" and "efficiency" are frequently used in the context of discussions about improving health system performance. But what do these terms actually mean? *Effective care* includes services that are of proven clinical value. It is medical care for which the benefits to patients far outweigh the risks, such that all patients with specific medical needs should receive it. *Efficient care* includes medical services that maximize quality and health outcomes, given the resources committed, while ensuring that additional investments yield net value over time.

In the United States, there is clear empirical evidence that many patients do not receive the highest quality of care possible. That is, patients do not receive care that fully complies with current clinical guidelines. In one well-respected study, researchers found that only 54 percent of acute care and 56 percent of chronic care provided by physicians conformed to clinical recommendations in the medical literature. Receiving better quality care, particularly for those with chronic conditions, has the potential to reduce the adverse impacts of existing illnesses and prolong life.

There are large differences in the levels of effective care provided in the United States, a result that reflects differences both in provider practice styles and in patient preferences. Researchers associated with the Dartmouth Atlas of Health Care have reported extensive geographic variation in medical care spending and in the use of medical care across a wide range of services such as preventive screenings, diabetes management, joint replacement surgeries, and end-of-life care. Differences across regions of the United States cannot be fully explained by differences in illness rates or well-informed patient preferences. In fact, this research finds that higher rates of utilization reported across the United States do not appear to be correlated with better health outcomes, and that nearly 30 percent of Medicare's costs could be saved without adverse health consequences if spending in high- and medium-cost areas of the country was reduced to levels in low-cost areas. The Administration has strongly advocated, in its policies, using information and better incentives to improve the effectiveness and the efficiency of health care delivery, including hospital care, physician services, and long-term care.

Health Information Technology

There is optimism among policymakers about the ability of health information technology (IT) to generate significant production efficiencies in the delivery of health care. This is because health IT permits the management of medical information and the secure exchange of information among consumers, providers, and payers. Using IT in health care may help reduce medical errors, provide physicians with information on best practices for diagnosis and treatment, improve care coordination, and reduce duplication of services. The most comprehensive form of health IT is an electronic health record, which is a longitudinal record of patient information that typically includes the patient's demographic characteristics, past medical history, medication use, vital signs, laboratory data, and radiology reports.

One goal of the Administration is for most Americans to have an electronic health record by 2014. While providers have expressed interest in the potential benefits of IT for workflow improvement, adoption has been somewhat slower than anticipated. Results from a survey conducted by the Office of the National Coordinator for Health IT indicate that 14 percent of outpatient doctors currently use an electronic health record, and a study sponsored by the American Hospital Association finds that 68 percent of hospitals have or are in the process of implementing an electronic health record. Key barriers to adoption of health IT include lack of a business case to support adoption; privacy and security concerns; technical issues that make exchanging information difficult; and organizational culture issues, including providers' resistance to changing business processes.

In response to these concerns, the Administration formed the American Health Information Community, a Federal advisory body that includes experts from the public and private sectors, to make recommendations to the Secretary of Health and Human Services about how to accelerate the development and adoption of health IT. Over the past few years, this advisory body has also provided recommendations on how to make records digital and available for providers to share easily, as well as how to assure the privacy and security of those records.

Comparative Effectiveness

For many types of medical conditions, a patient may have a choice between at least two diagnostic methods and/or treatments that have different benefits and risks. Selecting the most appropriate course of care relies on having current information about the effectiveness of each option, given a patient's characteristics. Comparative effectiveness research studies are rigorous evaluations that compare the performance of various diagnostic and treatment options for specific medical conditions and sets of patients. By using

comparative effectiveness research findings, providers can help patients select the most clinically appropriate course of treatment. Advocates of comparative effectiveness research also suggest that widespread use of research findings may help to reduce some of the geographic variation in utilization and spending that exists in the United States.

The number of comparative effectiveness studies has increased in recent decades, and provides the potential to improve the quality of care delivered to patients. A recent Federally-sponsored comparative effectiveness initiative is the Agency for Healthcare Research and Quality's Effective Health Care Program. Created as part of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, this program funds the creation of new research, synthesizes current research on the benefits and risks of alternative medical interventions, and translates these findings into useful formats that can be easily accessed by health care providers and patients.

Price and Quality Information Transparency

When individuals shop for many goods or services, often they can access information on prices and quality using readily available sources. With this information, they can compare alternatives and then select the one of highest value. Unfortunately, the same information is not readily available for health-related goods and services. Having information on prices and provider quality may be important as people consider which physicians or hospitals to select for care and what impact this might have on their out-of-pocket costs (such as copayments or coinsurance) and their potential health outcomes.

To illustrate, suppose a couple learns that they are expecting their first child and that their physician has admitting privileges at the two hospitals in their community. Wanting to make an informed decision about which hospital they should use for the birth, this couple would benefit from being able to look on their insurer's web site to find information about the price that each hospital charges for different types of deliveries. With this information, they could assess how much it will likely cost them out of pocket for a normal delivery, given their insurance coverage. Additionally, the couple would be able to find information on each hospital's web site about the quality of its maternity services, including the volume of deliveries during the past year, the proportion of deliveries that were performed by Cesarean section, and whether there is a neonatal intensive care unit at the facility.

One challenge in health care is that there are actually two types of prices: list prices and transaction prices. List prices, which are also called charges, are well-documented and are found in all standardized information that hospitals and physicians submit when seeking payment for services. However, list prices are often not relevant because most payers, whether private insurers, Medicare, or Medicaid, pay much less than the list price. The payment

that is actually made by the insurer to the provider is called a *transaction price*. Unfortunately, this information is more difficult to access because it is insurer-specific and providers may be sensitive about having negotiated rates available in the public domain.

In the past 20 years there have been tremendous advances in the development of objective measures of clinical quality for chronic diseases, acute care, preventive care, and long-term care. Improvements in health care quality measurement as well as better information systems are making it easier to evaluate provider performance and generate information that is relevant and timely for providers and individuals. Increasing the transparency of information about health care quality can motivate providers to improve the care that they deliver, and it can help consumers to make more informed decisions regarding their provider choices. A key priority for the Administration has been public reporting of price and quality information. In addition to advocating for greater transparency across the entire health care system, the Federal Government and the Centers for Medicare and Medicaid Services, in particular, have developed Hospital Compare, Nursing Home Compare, and the Medicare Prescription Drug Plan Finder, which are comprehensive, web-based resources providing quality and pricing information.

Pay-for-Performance

Pay-for-performance refers to purchasing practices aimed at improving the value of health care services that are provided to patients, where value depends on both quality and cost. Private insurers, as well as Medicare and Medicaid, are using pay-for-performance programs that provide doctors and hospitals with financial incentives to meet certain performance measures for quality and efficiency or to show quality improvement. Researchers in the private and public sectors are conducting numerous evaluations of pay-for-performance programs to assess whether these programs affect provider behavior and improve the quality of care that patients receive.

One such evaluation includes the Premier Hospital Quality Incentive Demonstration Project, which started in 2003. In this Medicare demonstration, hospitals receive bonus payments based on their performance on five medical conditions, including acute myocardial infarction (heart attack), coronary artery bypass graft, pneumonia, heart failure, and hip/knee replacement. Improvements in quality of care during the first 3 years of the demonstration have saved the lives of an estimated 2,500 acute myocardial infarction patients, based on an analysis of mortality rates at participating hospitals. Additionally, more than 1.1 million patients treated in the five clinical areas at participating hospitals have received approximately 300,000 additional services or recommendations that align with evidence-based clinical quality measures, such as smoking cessation advice, discharge instructions, and pneumococcal vaccination.

Using Market-Based Approaches to Improve Access to Health Insurance

The financial burden of health care costs can be extensive, particularly for those who have a serious health episode, such as cancer or a trauma-related injury. In the United States, about 80 percent of medical care expenditures each year are generated by about 20 percent of the population. Health insurance provides individuals with financial protection against costs associated with medical treatment, giving them access to needed and valuable care that otherwise might not be affordable. This section provides an overview of current health insurance coverage patterns and discusses key Administration initiatives to promote market-based approaches and new types of insurance benefit designs to provide individuals with greater flexibility as they choose coverage that best meets their needs.

Private Health Insurance

The private market for health insurance is really two markets—one for employer groups and another for individuals. Currently, 165 million Americans under 65 years of age obtain their coverage through an employer source, either as a worker or a dependent of a worker, and approximately 17 million non-elderly individuals purchase coverage in the individual market.

In the United States, employer provision of health insurance is voluntary, and while 99 percent of large firms (those with 200 or more workers) offer coverage to their workers as a benefit, a smaller percentage of small firms do. In 2008, 62 percent of small firms (those with 3–199 workers) offered their workers health insurance, down from 68 percent in 2000. Two main factors cause small firms to be less likely to offer health insurance as a fringe benefit relative to large firms. First, small firms may have difficulty pooling risk effectively. Very small groups, in particular, may be less able to absorb the financial shock of a high-cost, low-probability medical problem by one or more of their employees, which may result in higher premiums for a specific amount of coverage, as well as larger rate increases over time. Second, there are human resources costs for firms when they shop for insurance, coordinate enrollment with employees, and integrate employee contributions toward the premium with payroll. If the per-worker administrative costs of insurance are higher for small firms, they may be less likely to offer coverage.

For individuals who are not offered health insurance through an employer, the individual market is an alternative way to acquire coverage. Many who purchase insurance in this market use it as a bridge between jobs that provide employer-sponsored insurance or between employer-sponsored coverage and

Medicare. For others, including the self-employed, coverage purchased in the individual market may need to serve their needs over the long term.

There are several different types of health insurance plans available in the private market, including health maintenance organizations, preferred provider organizations, and point-of-service plans. In addition to traditional managed care plans, a new generation of insurance benefit designs, called *consumer-directed health plans,* is emerging. Consumer-directed health plans typically have three basic features: a high deductible, which is the dollar amount that has to be paid before an insurer covers any medical expenses; an associated account that can be funded with pre-tax dollars and can be used to pay for out-of-pocket medical expenses; and tools to help enrollees make decisions about their medical care treatment options. The two most prevalent forms of consumer-directed health plans are Health Reimbursement Arrangements, which are offered by employers, and Health Savings Accounts, which are offered in both the employer group and individual markets. See Box 7-1 for information about Health Savings Accounts.

Box 7-1: Health Savings Accounts: Innovation in Benefit Design

Health Savings Accounts (HSAs) were signed into law by the President in 2003 as part of the Medicare Prescription Drug, Improvement, and Modernization Act. HSAs are tax-advantaged savings accounts to which individuals can contribute funds that they can then use to pay for qualified medical expenses. HSAs are used in conjunction with High-Deductible Health Plans that meet specific criteria. In particular, these plans must have a minimum deductible of $1,150 for single coverage and $2,300 for family coverage in 2009, an annual out-of-pocket limit of no more than $5,800 for individuals and $11,600 for families in 2009, and catastrophic coverage in case an individual or family exceeds the out-of-pocket limit as a result of a serious medical episode. Health plans that meet these criteria are referred to as HSA-compatible or HSA-eligible plans.

HSAs are available in both the employer group and individual markets. When offered in an employer setting, both an employer and employee can contribute money to the account, up to specific limits ($3,000 for individuals and $5,950 for families in 2009). Also, employees whose health plans meet the deductible and out-of-pocket limit criteria described above can open an HSA on their own if their employer does not open an account for them. Unused balances may be rolled over from year to year and accumulate interest, thus allowing individuals to build up savings that can be used to cover future medical expenses. Additionally, HSAs are portable, which means that individuals are able to

continued on the next page

Box 7-1 — continued

keep any unspent funds in the account when they change employment or exit the labor force.

Enrollment in HSA-compatible health plans has been growing steadily each year. In 2006, over 6.8 million employees and dependents were enrolled in High-Deductible Health Plans, and over 30 percent of these enrollees were in small firms. As of January 2008, approximately 1.5 million consumers had purchased HSA-compatible plans in the individual market. HSAs in combination with a High-Deductible Health Plan are playing an increasingly important role in the individual market, providing an option that is more affordable, on average, than other traditional types of health plans.

HSAs and High-Deductible Health Plans are designed to encourage more consumer control over health care decision making, but concerns have arisen about the impact that these plans may have on policyholders' care-seeking behavior. In particular, some believe that the deductible may lead individuals to forgo or delay getting care such as preventive screenings (for example, mammograms). To mitigate this concern, most insurers now provide some coverage before the insured person meets his or her deductible. Research that analyzes the impact of HSAs and High-Deductible Health Plans on medical care utilization and expenditures is mixed. In coming years, as these plans gain market share, research may help to clarify the full effect of this type of benefit design on care-seeking behavior and costs.

The employer group and individual markets for health insurance have unique advantages and disadvantages. Employer groups are generally able to pool risk, as individuals within an employer group initially come together for a purpose other than buying health insurance and because larger numbers of covered people makes it easier to predict the average expenditure of the group. Effective risk pooling is often more challenging in the individual market, given the potential for adverse selection, whereby individuals who expect high health care costs are more likely to buy coverage, while those who expect to have low costs may be less likely to do so. If insurers are not able to fully identify the risk of individuals seeking coverage and premiums are set according to the average risk in the population, then there will be insufficient funds to cover the claims that are generated. In most States, health insurers use medical underwriting to assess individuals' risk for generating medical expenditures based on their demographics, health status, and past utilization.

Another important distinction between the employer group and individual markets is the tax treatment of premiums. For employer-sponsored insurance, premiums that are paid by employers are exempt from the Federal income

tax, State income taxes in 43 States, and Social Security and Medicare taxes. In addition, many employees can pay their share of the insurance premium with pre-tax dollars if their firm offers a "Section 125" plan. The amount of forgone revenue associated with excluding tax on premiums is often referred to as the "tax subsidy" for employer-sponsored health insurance. The tax exclusion encourages employers to provide a larger share of workers' total compensation in the form of health insurance benefits, leading employers to offer generous coverage with low levels of coinsurance and deductibles. In turn, these low levels of cost-sharing can encourage moral hazard, whereby individuals use more medical care than they would if they were responsible for the full price of that care.

For self-employed workers and their families, there is a partial tax subsidy of health insurance, which allows them to deduct health insurance for themselves and their families from the Federal income tax (up to the net profit of their business) but not from the self-employment tax (equivalent to the combined tax that they would pay for Social Security and Medicare). For those who neither are self-employed nor have an offer of employer group insurance, medical care expenses, including the premiums for coverage purchased in the individual market, are tax deductible only when these expenses exceed 7.5 percent of adjusted gross income.

As discussed before, not all workers have access to employer-sponsored insurance; those who do may have limited choices, particularly if they are employed at a small firm. While the individual market provides an alternative way to acquire health insurance, for many it is not perceived to be as attractive as employer-sponsored insurance. One way to move toward balancing the attractiveness of the employer group and individual markets is to alter the current tax treatment of premiums. Removing the tax exclusion for employer premiums has the potential to eliminate many of the inefficiencies and equity issues associated with the current system; it would also increase Federal Government income tax revenues by up to $168 billion in FY 2009.

The President has proposed replacing the current tax exclusion with a flat $15,000 standard deduction for health insurance for families or $7,500 for individuals. The amount of the standard deduction would be independent of the actual amount spent on a health insurance policy, which would need to meet a set of minimum requirements for catastrophic coverage. Thus, individuals and families would still be able to take the full amount of the deduction from income and payroll taxes, even if their health insurance premium cost less than that amount. Although individuals with small tax liabilities would not stand to gain as much from a tax deduction as individuals with higher tax liabilities, this approach would make health insurance more affordable, particularly for those who do not have access to employer-sponsored coverage.

Public Insurance

Several programs funded by the Federal Government exist to provide health care to specific populations. These programs include the Federal Employees Health Benefits Program (FEHBP), TRICARE, the Veterans Health Administration (VHA), the Indian Health Service (IHS), Medicaid, the State Children's Health Insurance Program (SCHIP), and Medicare. The FEHBP and TRICARE are health insurance programs for Federal employees and active duty personnel, respectively. The Federal Government also provides medical care to veterans through the Veterans Health Administration. Run by the Department of Veterans Affairs, the VHA provided services to 5.5 million patients in 2007, up from 3.8 million in 2000. The Indian Health Service provides health care to members of Federally-recognized tribes and their descendants. This too is a public health care system in the sense that the Federal Government operates the IHS hospitals and employs the program's health care providers. In 2007, the IHS provided services to 1.5 million American Indians and Alaska Natives.

Established in 1965, Medicaid provides medical assistance for certain children, families, and elderly and disabled individuals with low incomes and low resources. Medicaid is administered by the States and is jointly funded by the Federal Government and States. In 2007, there were approximately 48 million Medicaid enrollees. Another public insurance program is the State Children's Health Insurance Program (SCHIP), which was created in 1997. SCHIP enables States to provide health insurance coverage for low-income children who do not qualify for Medicaid. SCHIP is also administered by the States and jointly funded by the Federal Government and the States. States receive an enhanced Federal matching rate for SCHIP that is higher than their Medicaid matching rate but capped at a fixed level. During fiscal year 2007, more than seven million children were enrolled in SCHIP.

Medicare, also begun in 1965, provides health insurance to nearly all individuals aged 65 and older, as well as some younger individuals with permanent disabilities or those who have been diagnosed with end-stage renal disease. Today, there are approximately 44.6 million Medicare beneficiaries. As discussed in Chapter 6, Medicare consists of four parts: Part A provides coverage for inpatient hospital services, some home health care, and up to 100 days in a skilled nursing facility. Part B provides coverage for outpatient services, including outpatient provider visits and certain preventive screening measures. Part C, also known as Medicare Advantage, provides beneficiaries with the option of enrolling in one of several types of private health plans rather than traditional, fee-for-service Medicare. Finally, Part D provides coverage for outpatient prescription drugs.

Revitalizing and strengthening Medicare Advantage has been a key priority for the Administration. As an alternative to traditional Medicare, beneficiaries may enroll in one of several types of private health plans, including health maintenance organizations (HMOs), preferred provider organizations (PPOs), and private fee-for-service (PFFS) plans. For the past 3 years, 100 percent of Medicare beneficiaries have had at least one Medicare Advantage plan available in their local geographic market, up from 75 percent in 2004. Currently, nearly 10 million people, or over 20 percent of all Medicare beneficiaries, are enrolled in Medicare Advantage plans.

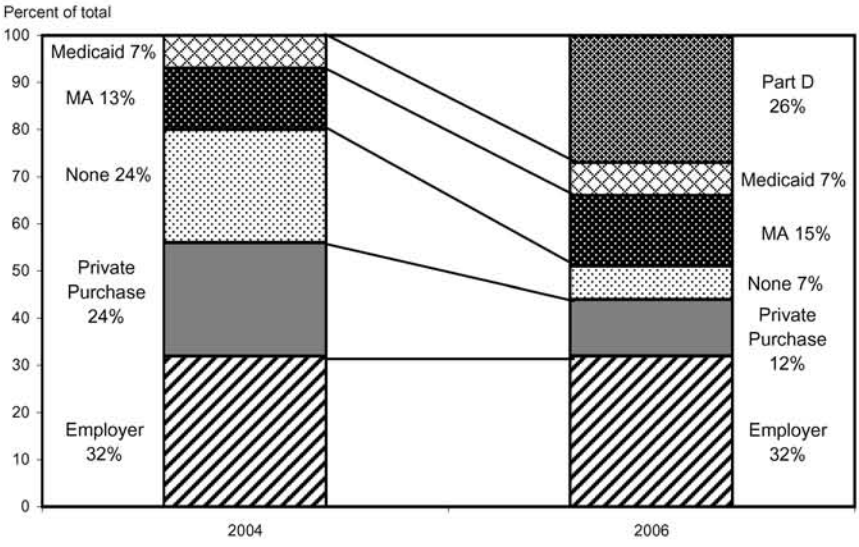
Many beneficiaries are attracted to Medicare Advantage plans because these plans typically cover services that are not covered under traditional Medicare, such as dental care, certain preventive services, and care management for those with chronic conditions. Additionally, Medicare Advantage enrollees may have lower out-of-pocket costs. For 2008, Medicare Advantage plans offered an average of approximately $1,100 in additional annual value to enrollees in terms of cost savings and added benefits. Of course, it is important to acknowledge that beneficiaries who enroll in Medicare Advantage plans must comply with the particular policies of those plans when using services. In some cases, this may include using only providers in the plan's network.

One of the most significant changes in Medicare during this Administration was the creation of Part D, a voluntary program in which beneficiaries are able to purchase prescription drug coverage from private health plans that contract with Medicare. On average, beneficiaries pay 25.5 percent of the cost for standard drug coverage, while the Federal Government subsidizes the remaining 74.5 percent. Each year, beneficiaries can choose a drug benefit plan from a large number of diverse plan offerings. This variety ensures that beneficiaries are able to select the insurance policy that best meets their preferences.

Before Part D was created, beneficiaries could obtain drug coverage by using an employer retiree plan, if they had one; purchasing a private Medigap plan; enrolling in a Medicare managed care plan; or using Medicaid coverage if they were dually eligible. Chart 7-4 illustrates the change in prescription drug coverage among beneficiaries between 2004 and 2006, the year that Part D was fully implemented. In 2004, 24 percent of Medicare beneficiaries lacked prescription drug coverage. By 2006, many of these Medicare beneficiaries obtained prescription drug coverage by choosing a stand-alone drug plan or a Medicare Advantage (MA) plan.

Part D has had important effects on beneficiaries' out-of-pocket spending and their adherence to the medication protocols they have been prescribed. Recent analyses from the Health and Retirement Study data found that the introduction of Part D has been associated with a median decrease of

Chart 7-4 **Prescription Drug Coverage for Medicare Beneficiaries in 2004 and 2006**
The implementation of Medicare Part D resulted in significant changes for how Medicare beneficiaries obtain coverage for prescription drugs.



Note: Due to rounding, percentages may not add to 100.
Source: The University of Michigan Health and Retirement Study.

$30 per month in out-of-pocket spending among the newly insured population, compared to median baseline spending of $100 per month. When prescription drugs are not affordable, individuals may not adhere to their prescribed regimes. They may skip doses, reduce doses, or let prescriptions go unfilled. Recent work finds a small but significant overall decrease in cost-related medication non-adherence following the implementation of Part D. Both the revitalization of Medicare Advantage and the creation of Medicare Part D represent important steps for ensuring that beneficiaries have affordable choices for their health insurance.

The Uninsured

An important issue facing policymakers today is that a large number of individuals lack health insurance in the United States. In addition to providing important financial protection, health insurance can help people obtain timely access to medical care. Research has shown that having health insurance is positively related to having a usual source of medical care, receiving preventive services, and getting recommended tests or prescriptions. Based

on U.S. Census data, the current number of individuals who lacked insurance during the calendar year is estimated to be 45.7 million people, or roughly 15.3 percent of the population. It is important to note that some people in Federal survey-based counts of the uninsured actually may have access to public insurance, but do not wish to report their program enrollment due to the possible stigma, or have not yet enrolled despite their eligibility. Also, others in Federal survey-based counts of the uninsured may have access to private insurance but have chosen not to purchase it.

The uninsured are diverse in terms of their employment and demographic characteristics. Individuals in households that have a full-time, full-year worker make up about 62 percent of the non-elderly uninsured population. Even with strong ties to the labor force, many people may not be offered employer-sponsored coverage. Even if such coverage is available to them, many people may choose not to buy insurance because it is not affordable or they do not place much value on having insurance. Individuals who lack insurance also tend to be younger.

In 2007, roughly 58 percent of the uninsured were under the age of 35. Finally, the uninsured are more likely to be from lower-income households, although a significant proportion of the uninsured population is made up of people in higher-income households. As shown in Table 7-1, among households earning less than $50,000 per year, more than 20 percent of those households are uninsured. This contrasts with the highest household income category, where only 7.8 percent of individuals lack insurance.

Going forward, it is important that as the Federal Government continues to work on increasing the number of Americans who have health insurance, it uses approaches that effectively target those who are the greatest risk for being uninsured.

TABLE 7-1.—*Uninsurance Rates by Household Income Category*

Household Income	Population	Number of Uninsured	Percentage of Population That is Uninsured
Less than $25,0000	55,267,000	13,539,000	24.5%
$25,000–$49,999	68,915,000	14,515,000	21.1%
$50,000–$74,999	58,355,000	8,488,000	14.5%
Greater than $75,000	116,568,000	9,115,000	7.8%

Source: Income, Poverty, and Health Insurance Coverage in the United States, 2007, U.S. Census.
Note: Due to rounding, percentages do not add to 100.

Investing in Public Health

The Federal Government plays an important role in identifying and addressing public health issues. This Administration has pursued several public health investment areas, including building a stronger safety net for the medically underserved, preparing for disease outbreaks and bioterrorism threats, supporting health-related research, and taking a leadership role in global health-improvement activities focused on HIV/AIDS and malaria.

Strengthening Community-Based Health Care

The Health Center Program is a Federal grant program that offers funding to local communities for providing family-oriented primary and preventive health care services. Health centers serve as an important safety net for people who need medical care but are underserved, including those without health insurance. Health centers provided care to more than 16 million individuals in 2006, and they are located in all 50 States and the District of Columbia. In 2002, the President made a commitment to create 1,200 new or expanded sites—a goal that was attained in 2007. Additionally, Federal funding for health centers has increased to $2 billion annually.

Preparing for Public Health Emergencies

The Federal Government plays an important role in ensuring a timely and appropriate response in the event of a public health emergency, such as an influenza pandemic or a bioterrorism threat. These types of situations could potentially lead to high levels of illness, social disruption, and economic loss, and therefore it is important for the Federal Government to invest resources in developing strategies to prepare for them. Working in collaboration with the States, the Federal Government has provided funding, advice, and other assistance to State and local planning efforts.

Supporting Research

Health-related research is multidisciplinary. It includes biomedical and epidemiological work that can reduce a population's mortality and morbidity risks from disease; economic analyses that investigate consumer and provider decision making; and health services research that examines issues such as medical care utilization, quality, and access to services. Americans rate health research as a high national priority. For fiscal year 2009, Federal funding for the National Institutes of Health is $29.5 billion. These resources will be used predominantly for supporting more than 38,000 research grant awards. It is beneficial to have a balance between investments that support biomedical

research and those that address critical issues pertaining to the delivery and financing of health care, particularly given the substantial amount of resources that are going to be required to meet the medical care needs of the population in future decades.

Promoting Global Health Improvement

Many nations across the world are developing strategies to deal with consequences from the broad transmission of serious diseases, including HIV/AIDS, malaria, and tuberculosis, among others. In less developed parts of the world, people who contract these diseases face a much higher risk of mortality than do people in more developed parts of the world. There is also a significant economic impact from disease. In addition to the direct costs of medical treatment, high rates of serious disease within a population can hinder economic development. For example, HIV/AIDS may lead to large-scale losses in work productivity as the disease progresses and leaves those who are infected and their caregivers unable to work. Studies suggest that the high rate of HIV/AIDS has reduced the average national growth rates in African countries by 2 to 4 percent per year. Over the long term, high levels of disease also may inhibit educational investment, as shorter life expectancy diminishes incentives for human capital investment.

In 2003, the United States took a leadership role in supporting HIV/AIDS treatment, care, and prevention programs around the world, including in 15 countries that together have half of the world's HIV infections: Botswana, Côte d'Ivoire, Ethiopia, Guyana, Haiti, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Vietnam, and Zambia. Known as the President's Emergency Plan for AIDS Relief (PEPFAR), this program has supported more than 57 million HIV counseling and testing sessions and has supported care for more than 10.1 million people infected or affected by HIV/AIDS, including more than 4 million orphans and vulnerable children worldwide. Additionally, through September 30, 2008, PEPFAR supported antiretroviral treatment for approximately 2.1 million people and prevention of mother-to-child transmission interventions during more than 16 million pregnancies. In 2008, Congress extended this program for an additional 5 years and significantly increased its authorized funding level.

A second global health initiative pursued by the Administration has been prevention and treatment of malaria. Each year, more than 1 million people die of malaria, most of them young children in Sub-Saharan Africa. It also causes serious morbidity, as those who are infected tend to lose, on average, 6 weeks from school or work due to the illness. Spending related to the disease can account for as much as 40 percent of public health expenditures, as well as high levels of household out-of-pocket expenditures. Beyond imposing high medical costs and lower incomes due to absenteeism, malaria

is likely to impose indirect costs through broader macroeconomic channels, including underdeveloped tourism industries and lower levels of foreign direct investment.

In June 2005, the President's Malaria Initiative was announced. This initiative represents a public–private partnership among the U.S. Government, nongovernmental organizations, corporations, foundations, and faith-based service organizations, with the goal of reducing the mortality rate from malaria in 15 African countries by 50 percent. In 2007, the initiative's second year, 25 million people in Sub-Saharan Africa are estimated to have benefited from the program. More than 6 million long-lasting, insecticide-treated mosquito nets have been purchased, with two-thirds of those nets distributed.

Conclusion

The U.S. health care system is at a critical juncture. While advances in medical technology help millions of Americans lead longer and healthier lives, the rising cost of health care is both threatening the ability of Americans to access care that is affordable and is increasing the strain on Federal and State budgets. There are several opportunities to increase the value of health care and improve health insurance coverage. This Administration has pursued policies to improve the efficiency of health care markets through increased consumer involvement, improved choices, information transparency, and incentives to providers for delivering high-quality, efficient care.

This Administration has also pursued policies to improve the health insurance options of Americans. With the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, Medicare was expanded to provide beneficiaries with improved access to affordable prescription drugs. Additionally, this legislation created Health Savings Accounts, which, in combination with High Deductible Health Plans, give individuals the incentive to become more active decision makers regarding their health care and health investments. Finally, this Administration has held to its commitment to make important investments in public health, including the expansion of Health Centers, collaboration with States and local governments to prepare for potential crises or threats, support of health-related research and development, and promotion of global health-improvement initiatives.

CHAPTER 8

Education and Labor

Long-term economic growth requires a productive workforce with the skills necessary to compete in a global labor market. The Administration's commitment to boosting the high productivity of American workers is evident in successful education and training policies. These include initiatives to increase primary and secondary school accountability, to ensure broader access to higher education, and to train workers so that they may take advantage of new high-paying job opportunities.

Real disposable income grew steadily during the Administration, and earnings per hour outpaced inflation despite large increases in energy prices and a growing portion of employee compensation being paid in non-wage benefits. Real median household income did fall slightly during the Administration, but this decline began prior to the Administration taking office. The Administration included several years of strong growth in real median household income from 2004 to 2007. The strongest pension reform measures in over three decades were also enacted. These offered important protections to workers who depend on their firm's pension plans for their retirement incomes.

Challenges lie ahead, however, and the most successful initiatives of the Administration must be bolstered. A continued commitment to better quality in kindergarten through twelfth-grade (K–12) education and broader access to higher education will help produce the additional workers the United States needs to meet the increasing worldwide demand for highly skilled labor.

In addition to these challenges, some related issues will need to be addressed, and education and labor policy will be important elements. First, the high level of income inequality in the United States calls for educating and training a greater number of workers, as better and more widely dispersed skills will be a force in reducing income inequality in the United States. Furthermore, the United States also needs comprehensive reform of its immigration policies. The principles of this Administration's immigration plan, which include a number of education and labor initiatives, will likely be the starting point for future discussions.

The key points of this chapter are:

- Education benefits individuals through higher earnings, and benefits society as a whole. Administration initiatives to improve K–12 education,

most notably the No Child Left Behind Act, are demonstrating clear, measurable results.

- Access to higher education was maintained through an expanded Pell Grant program and proactive efforts that helped protect Federally subsidized student loans from recent credit issues faced elsewhere in the economy.
- Despite a small decline in real median household income, which had begun prior to the Administration taking office, hourly earnings of workers outpaced inflation, and real per capita disposable income rose substantially during the past 8 years. Median household income increased steadily after the recovery began in earnest in 2004. Also, pension reforms were enacted to help protect retirement income.
- Income inequality and immigration reform must still be addressed. Strong support for education and a focus on workers' skills can help close income gaps. Reform of immigration policies must provide border security while allowing the economic benefits that immigrant labor provides to the economy.

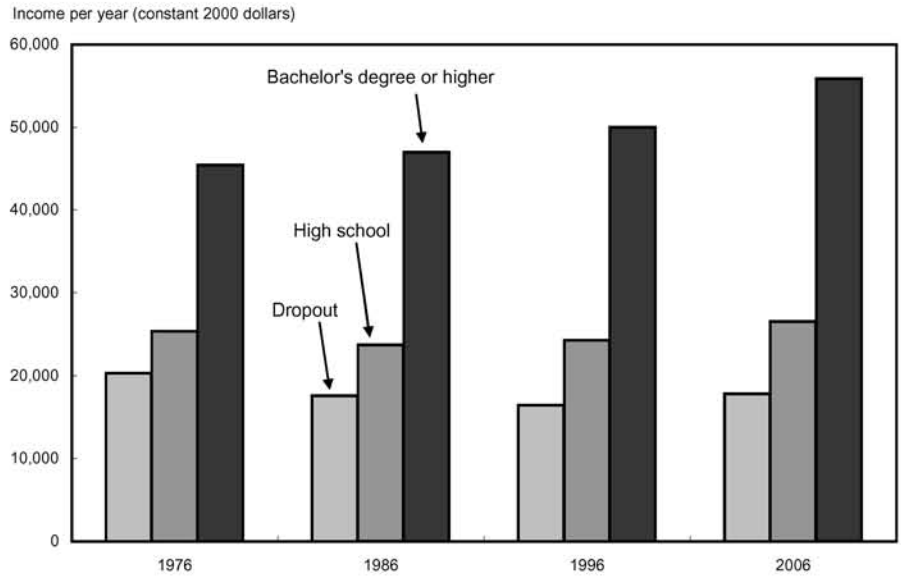
Economic Benefits of Education

Education is an investment. As with other investments, people compare benefits and costs when deciding whether to invest. The benefits of a quality education are widespread, with greater earnings being enjoyed by people and families who invest in education. Also, there are additional, non-pecuniary benefits of education that are enjoyed by both individuals and society at large. Education is also a key component of worker productivity and long-term economic growth.

For most people, a strong motivation to obtain additional years of schooling is the labor market return they expect to receive. Indeed, according to Chart 8-1, adults with a bachelor's or an advanced degree earn considerably more than adults with a high school degree. Likewise, those with a high school degree earn more than those who failed to complete high school. The gap between the earnings of those with a college education and those with a high school education, however, has grown since the 1970s. Currently, the average recipient of a college degree earns well over twice the amount earned by the average adult without a degree. Although any one individual's benefit from a college degree will differ due to ability, choice of major, and other factors, the expected return for investments in education undoubtedly motivate people to attend college.

Chart 8-1 does not take into account other individual benefits of education, most notably improved health. A substantial number of recent studies have

Chart 8-1 **Average Adult Real Earnings by Educational Attainment**
Earnings increase substantially with education, and the return has grown over time.



Source: Department of Commerce (Bureau of the Census, Current Population Survey).

shown that a direct link exists between educational attainment and health, even after holding income constant. One reason for this link may be the fact that people with greater educational attainment make better choices that impact their health positively, such as getting more exercise or not smoking. Education might also improve one's ability to navigate a complex health care system. Although the health returns to education are difficult to price in monetary terms, people surely value their health.

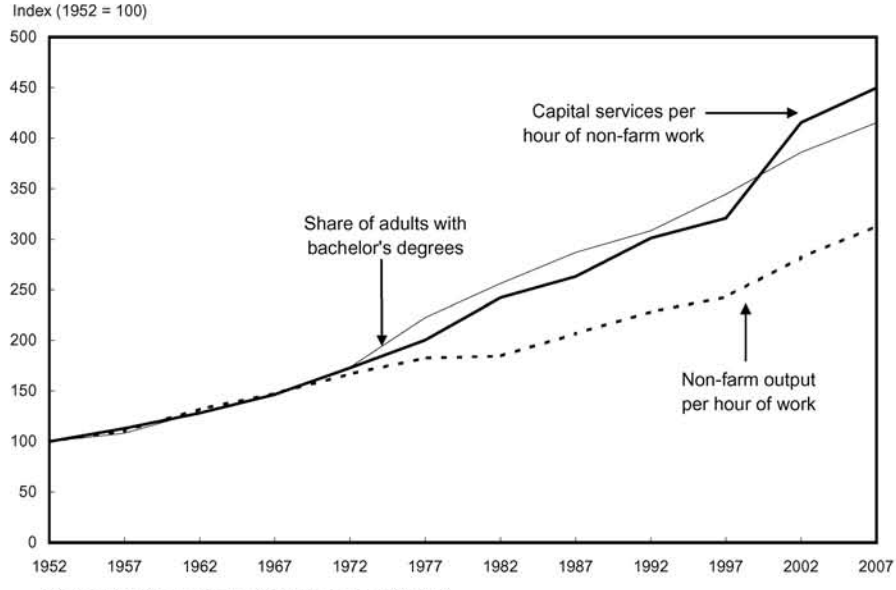
In addition to an individual's benefit from more education (greater earnings and better health), society benefits from a better-educated population. Education has been shown to foster civic-mindedness. For example, education makes it more likely someone will vote or support free speech. It also improves social skills and reduces crime. These effects of education positively affect fellow citizens as well as the individuals obtaining the education.

Finally, education is a key component of economic growth. Chart 8-2 illustrates the sustained productivity growth the United States has enjoyed throughout the past half century. It sets an index of output per hour of work for all non-farm workers to 100 in 1952 and displays the index over 5-year increments through 2007. The chart indicates that productivity has grown more than 200 percent over the past half century. Chart 8-2 also plots indexes of educational attainment (measured as the share of adults with a bachelor's degree) and capital services (for example, machinery and

equipment) per hour. Both educational attainment and capital intensity, which measures the extent to which capital is used with labor, show strong upward trends. This means that in recent decades, businesses have not only employed an increasingly educated workforce, but have also put more capital (especially computers and high-tech equipment) at the disposal of this workforce. Through better production processes and management, businesses have also become more efficient in using labor. Education, capital intensity, technological advances, and efficiency gains are all interrelated in complex ways, but research has credited education with as much as one-third of the growth of U.S. productivity from the 1950s to the 1990s.

As more of the population achieves higher levels of education and the education they receive is of better quality, additional productivity benefits start to take hold through *spillover effects*. Educated workers share their knowledge and skills with each other, thereby increasing their combined productivity. Moreover, an increasingly skilled workforce fosters technological advancements that increase the demand for even more skilled workers. This technologically driven increase in demand has been great enough in the United States to drive up the wages for skilled workers even as the supply of such workers is increasing.

Chart 8-2 **Growth in Educational Attainment, Capital Intensity, and Labor Productivity over Time**
Education and the use of capital per hour of work have grown, spurring productivity growth.



Source: Department of Labor (Bureau of Labor Statistics).

There are also benefits to moving the entire population up to a basic level of competence because the labor market continues to demand increasing skills of its participants in virtually all tasks. Thus, the focus of the current Administration on improving K–12 instruction of every student in the United States is well placed.

Primary and Secondary Education

A strong commitment to education begins with ensuring that every child has access to quality primary and secondary schools. The No Child Left Behind Act (NCLB), which is intended to accomplish this goal, has been the centerpiece of the Administration's education policy. The NCLB Act was signed into law in January 2002 and has since reshaped the Federal role in the provision of K–12 education in the United States. It holds schools accountable for the performance of students, provides parents with more information and more choices, gives States and localities more flexibility in using Federal funds to meet the needs of children they serve, and promotes proven education methods. Among its many provisions, two innovative approaches to improve the quality of education stand out: holding schools accountable for making adequate yearly progress toward NCLB goals, and facilitating school choice options and supplemental education services for students in schools that are failing to meet standards.

Under the adequate yearly progress provisions of NCLB, each State is charged with developing its own guidelines for determining whether schools make sufficient progress each year toward the NCLB goal that all students be proficient in math and reading by 2014. If a school receives NCLB funds due to its low-income status and fails to meet its State's standards for adequate yearly progress for consecutive years, that school is identified as needing improvement and faces an escalating set of interventions. Students can transfer to another school in the same district. In addition, low-income students in the schools are offered supplemental education services (such as tutoring services or other academic help), which are paid for out of Federal funds. School districts have the obligation to notify parents of these options and to provide a list of approved supplemental education service providers in their area. A school that continually fails to make adequate yearly progress is subject to takeover or restructuring by the State.

Early Signs of NCLB Success

The success of NCLB will take years to determine, as current cohorts of students complete high school and move on to college or the workforce, but early indications are encouraging. The top panel of Table 8-1 summarizes

recent trends in standardized math test scores for fourth graders as reported by the National Assessment of Educational Progress, which periodically tests fourth and eighth graders across the country. Researchers suggest that math test scores are a good way to judge achievement because they predict future labor market success well. The scores of students who were in fourth grade in 2005 and 2007 (no test was given in 2006) provide the most information because most if not all of their schooling to that point was during the time of the NCLB. These scores are from national standardized tests, and each State sets it own definition of proficiency, so the table is more indicative of general changes in student performance over time rather than actual progress toward a specific State's proficiency standard.

Table 8-1 shows that early in this decade, less than 10 percent of low-income students and less than 25 percent of all students were proficient in math (with low-income defined as being eligible for government-sponsored free lunch programs). Over 50 percent of low-income students were below even basic levels at that time. By 2007, however, 82 percent of students had reached the basic level, and the number of students achieving proficiency had increased from 24 percent in 2000 to 39 percent in 2007. For low-income students, the percent proficient has nearly tripled, from 8 percent in 2000 to 22 percent in 2007. This is encouraging evidence, but we must use caution in attributing these increased test scores to NCLB directly. For example, there were increases in math and reading scores from 2000 though 2003, and this may reflect some upward trending of scores before NCLB took effect in 2002. This pre-NCLB trend could be reflective of an accountability movement that was taking shape across the country, which culminated in Federal

TABLE 8-1.—*Proficiency Levels of Fourth Graders*

Math Achievement					
	1996	2000	2003	2005	2007
Percent Proficient or Above					
Among All Students	21%	24%	32%	36%	39%
Among Students Eligible for Federal Lunch Programs	8%	8%	15%	19%	22%
Percent at Basic Level or Above					
Among All Students	63%	65%	77%	80%	82%
Among Students Eligible for Federal Lunch Programs	40%	43%	62%	67%	70%
Reading Achievement					
	1998	2000	2003	2005	2007
Percent Proficient or Above					
Among All Students	29%	29%	31%	31%	33%
Among Students Eligible for Federal Lunch Programs	13%	13%	15%	16%	17%
Percent at Basic Level or Above					
Among All Students	60%	59%	63%	64%	67%
Among Students Eligible for Federal Lunch Programs	39%	38%	45%	46%	50%

Source: U.S. Department of Education (National Center for Educational Statistics)

law through NCLB. The continuing upward trend after NCLB was enacted is noteworthy, however, and under NCLB, test scores clearly are higher than they were before NCLB.

Although not shown, math test scores for eighth graders have improved as well, but the gains are slightly more modest. This is perhaps because the eighth graders have not had the benefit of NCLB for their entire school careers. More time will need to pass to appropriately evaluate results for eighth graders.

NCLB Challenges

Although the success in math that is illustrated in Table 8-1 is encouraging, the reading scores in the bottom panel of Table 8-1 have not increased as much as math scores. Math scores are better predictors of future labor market success, but the slower pace of improvement in reading scores should not be dismissed. The Administration's Reading First Program was enacted as part of the NCLB Act in 2002. This Department of Education program supports State educational agencies and local school districts that submit a plan to implement a scientifically based instructional reading program. Each submitted plan must demonstrate that students will be able to read by the end of third grade. The amount of support is based on the proportion of children in low-income households in each State. The program has demonstrated success in improving reading comprehension. For example, 44 State educational agencies reported improvements, and 31 of them reported an increase of at least 5 percentage points. Unfortunately, funding for this program was substantially reduced in fiscal year (FY) 2008.

Low test scores in poorer households are improving, according to Table 8-1, and achievement gaps are narrowing. Continuing to narrow the achievement gaps by raising test scores of low-income students remains an ongoing challenge that will require that attention be paid to some unique problems facing schools in high-poverty areas. For example, there is a high rate of teacher turnover in schools that serve low-income students. The most recent data available show a turnover rate in public schools in high-poverty areas that is 50 percent higher than in low-poverty areas.

Two components of the NCLB program that may help address the needs of low-income students are NCLB's supplemental education service and school choice options for students in failing schools. These programs are currently underutilized, alarmingly so in some districts. Parental outreach could be improved by providing more timely and better information about students' eligibility for these programs, and new Department of Education regulations specifying early notification requirements may help. In addition, ways to make school choice options more convenient for parents should be explored, because many parents are currently reluctant to enroll their children

in alternative schools largely because of the perceived inconvenience of doing so. School choice options are limited, however, for many districts where there are no schools to which a student can reasonably transfer.

Finally, high school graduation is valuable for future labor market success (Chart 8-1) and is the most likely path to college enrollment. An accurate method of calculating graduation rates that is uniform across States is necessary to improve high school accountability. Requiring school officials to have written confirmation that a student transferred out, immigrated to another country, or is deceased before removing the student from their graduation cohort will improve the accuracy of graduation rate calculations. Written confirmation will ensure that students who have dropped out of school are not counted as transfers; consequently, schools will be held accountable for dropouts and others who do not graduate from high school with a regular diploma. The final NCLB regulations require States to use the methodology adopted by the National Governors Association. This "4-year adjusted cohort graduation rate" uses the number of students who graduate in 4 years with a regular high school diploma divided by the number of students who entered high school 4 years earlier (adjusting for transfers in and out). The use of the 4-year adjusted cohort graduation rate is an improvement over previous systems not only because it is a uniform method of calculating graduation rates, which will allow for more meaningful cross-State comparisons, but also because this particular method will give parents and educators a more accurate picture of high school completion in their communities. This will improve the understanding of the scope and characteristics of the population of students who do not earn regular high school diplomas or take longer to graduate. Educators will be able to use this information to help local education agencies meet their State graduation rate goals and thus make adequate yearly progress.

Currently, high school dropout rates hover around 10 percent and have fallen since the inception of NCLB, from 10.5 percent in 2002 to 9.3 percent in 2006. High school dropout rates among certain population groups, however, remain remarkably high. For example, Hispanic students dropped out of school at a rate of 22.1 percent in 2006. Although this has decreased from 25.7 percent in 2002, it is still over twice the national average. Dropout rates in the southern United States (11.7 percent) far exceed those in the Midwest (6.1 percent) and Northeast (6.5 percent).

Because teachers are on the front line of the NCLB mission, future Administrations will need to do more to keep our best teachers in the classroom, particularly those who have been successful in reaching low-income students. The Administration supported tax deductions for the out-of-pocket expenses teachers incur while providing instruction, as well as loan forgiveness programs for teachers in low-income schools. While both of these programs are likely to provide some financial incentives, the need to find new ways to

help keep good teachers in classrooms still remains a challenge for improving K–12 education. The President's Teacher Incentive Fund has supported several pay-for-performance models around the country to help reward and retain outstanding teachers.

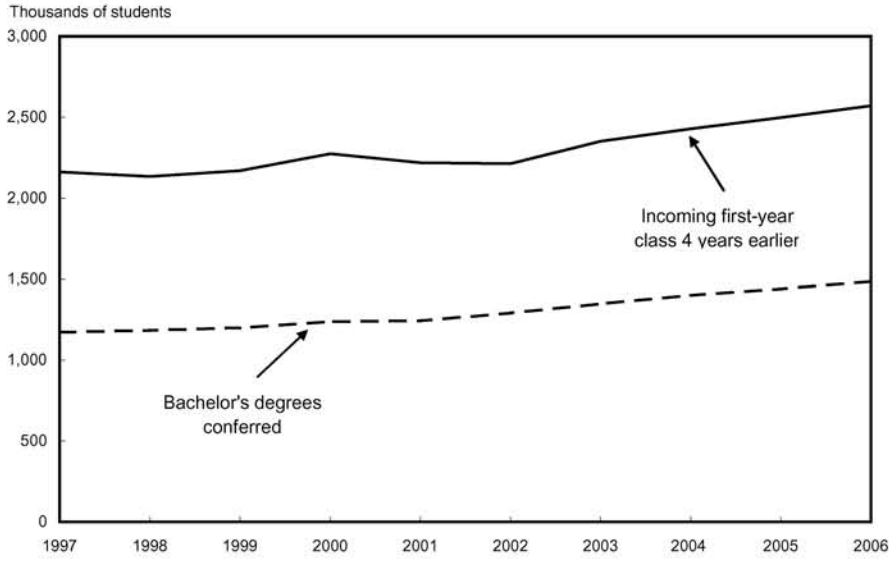
Higher Education

The U.S. higher education system is the best in the world. World rankings are dominated by American institutions, and the United States has long been the destination of many of the world's best students, teachers, and researchers. The American Competitiveness Initiative embodies the Administration's strong commitment to maintain the United States's standing as a leading producer of scientific knowledge, and it would increase the funding capabilities of grant organizations and expand the math and science curricula at primary and secondary schools. While keeping American universities competitive should remain a priority, maintaining student access to these institutions is perhaps even more important.

After several decades of growth, the share of high school graduates immediately transitioning to either a 2- or 4-year college has hovered around two-thirds since 1996. Although college enrollment is more likely among high school graduates from high-income families, about half of the students who graduated from high school in the poorest fifth of families have immediately enrolled in college since 2000.

Enrollment does not necessarily mean that a student receives a college degree. According to Chart 8-1, completing a 4-year degree is associated with the highest earnings. Thus, Chart 8-3 shows an unfortunate trend. Since 1996, there has been a large and steady gap between the number of students completing a bachelor's degree and the number of students enrolling in college 4 years before. Because it is true that many students take longer than 4 years to graduate from college, the gap depicted in Chart 8-3 does not capture everyone who will drop out. Nevertheless, the relative steady space between the two trends does show that college completion rates are low. This finding is backed up by more exact information on the number of enrollees who ultimately complete college (regardless of the number of years it takes), which indicates that the completion rate is only slightly above 50 percent. Furthermore, among 25- to 29-year-olds, the proportion of all college attendees with no bachelor's degree has remained at about 50 percent over the past decade. There are two things that can be done to help increase completion rates: continue with the Administration's efforts to improve K–12 education so that students are better prepared for college, and maintain access to grant aid to defray the increasing costs of education.

Chart 8-3 **Enrollees and Degrees Conferred**
The number of college graduates continues to rise, but the number of enrollees far exceed the number of degrees conferred.



Source: National Center for Educational Statistics.

College Preparedness

One reason for low college completion rates may be that many students are ill-prepared for the rigors of college education. One recent study suggests that nearly half of public high school graduates attending college in 2005 felt that there were notable gaps in their high school preparation. Moreover, college professors reported that about 42 percent of public high school graduates are not prepared for college-level classes.

There are reasons to be optimistic, however, because of the improved scores for fourth and, to some extent, eighth graders. In addition, the American Competitiveness Initiative contains a sound plan to devote significant resources to improving college preparedness through investments in math and science education. Congress also recently enacted the Adjunct Teacher Corps, a program proposed by the President that encourages well-qualified math and science professionals to serve as adjunct middle or high school teachers. There is more work to do at the high school level, however, and encouraging good teachers to remain in classrooms would likely improve college preparedness.

Funding Higher Education

The real cost of education (tuition and fees less aid and tax benefits) has increased substantially during this decade. In response to the rising costs, the Administration substantially expanded the Pell Grant program. Under this Administration, the total value of Pell Grants more than doubled from $8 billion in the 2000–2001 school year to $16.3 billion in the 2008–2009 school year. During 2008–2009, the maximum award available was $4,731, which exceeds the annual tuition and fees of attending a public 2-year institution and covers over 70 percent of the average tuition and fees of a public 4-year college. Pell Grant aid, however, is targeted to families with the greatest financial need, so the reality is that even large expansions in grant programs cannot keep up with increasing college costs for many families whose incomes are too high to qualify for Pell Grants. For millions of students, Federal Stafford loans provide essential assistance to help cover costs.

Stafford loans come in two forms. *Subsidized loans* defer payments until after students complete college, and the Government pays the interest while the students are in school. *Unsubsidized loans* allow deferred payments, but interest accrues while students are in school. Schools can sign up for Stafford loans to be handled by the Department of Education through the Federal Direct Loan Program or through private lenders that offer students loans through the Federal Family Education Loan Program. Because students represent a greater credit risk (they tend to be younger and have lower incomes), private lenders rely on the Government's guarantee against borrowers defaulting on loan payments. The Administration took action this year, as discussed in Box 8-1, to ensure continued access to the Federal student loan program in the face of credit markets disruptions.

Box 8-1: The Ensuring Continued Access to Student Loans Act of 2008

Largely unnoticed in the turmoil of the financial markets in 2008 was the fact that the Administration was proactive in avoiding a crisis in the student loan market. Many student lenders finance their lending by repackaging student loans and reselling them to investors in the secondary market. However, in early 2008, the disruption in credit markets made it increasingly difficult for lenders to resell loans. As a result, many of these lenders warned that they might not take part in the Federal student loan program for the 2008–2009 school year.

continued on the next page

Box 8-1 — continued

The Administration stepped in with an innovative program that was embraced by both parties in Congress.

On May 7, 2008, the President signed into law HR 5715, the Ensuring Continued Access to Student Loans Act of 2008. One of the critical provisions of this law granted the Secretary of Education the authority to purchase Federal Family Education Loan (FFEL) Program loans. Under this authority, the Department of Education created two programs: one in which it offers lenders the option to sell fully disbursed FFEL loans and another in which it purchases a participation interest in 2008–2009 FFEL loans. The programs were designed to retain lenders who might otherwise not have participated in the FFEL program; the ability to sell loans to the Department assured lenders that even if they had difficulty reselling the loans in the secondary market, they would not be stuck with the loans. The programs have also ensured that lenders originated new loans to students because lenders who sold their loans to the Department then had the funds necessary to originate new loans.

The intervention has helped the Federal student loan program function effectively so far this academic year despite the condition of financial markets. A projected 8.5 million students are attending college partly because they were able to finance their studies through the FFEL program. Recognizing that the financial crisis may impact the student loan program for the 2009–2010 year, Congress recently extended the authority for the Department of Education to purchase loans for another year. The Department has announced that it will replicate the current programs for the 2009–2010 school year. This will help ensure that students who are investing in their future through education will have access to Federal student loans despite current conditions in credit markets.

Labor Issues: Income Trends, Worker Flexibility, and Pension Reform

Real hourly earnings grew during the Administration, and real per capita disposable income (which includes income from labor and non-labor sources) rose substantially. The Administration also worked to promote retraining so that workers could fill jobs in demand. Finally, pension reform enacted in 2006 will help protect retirement incomes.

Recent Trends in Real Incomes

A common belief is that the incomes of working American families have not kept pace with inflation in recent years. Adjusting for inflation, it is indeed true that the annual median household income (measured in 2007 dollars) was $408 less in 2007 than it was at its peak in 1999, two years before this Administration took office. Although this is a decline in real terms, it tells an incomplete story of what happened during the Administration. Real median household income fell through 2004, but this represented a trend that began before the Presidency. Real median income strongly rebounded beginning in 2004 and reached near-peak levels by 2007.

Annual median household income, as reported by the Census Bureau, also includes both labor income and non-labor income. Thus, changes in median household income can be driven not only by changes in labor income but also by changes in income from investments and government transfer payments, such as Social Security or unemployment benefits. Turning to more specific measures of labor income, workers fared well during the Administration. Chart 8-4 plots an index of real hourly earnings for private non-farm production or non-supervisory workers from 1988–2007 (with real earnings in 1988 set to 100). The chart shows that real hourly earnings fell slightly through the early 1990s. After that, however, there was a long period of strong growth starting in the mid 1990s and continuing into the early part of this decade. Although it is true that real earnings are still less than their historic highs in the 1970s, 2007 marked their highest point since 1979.

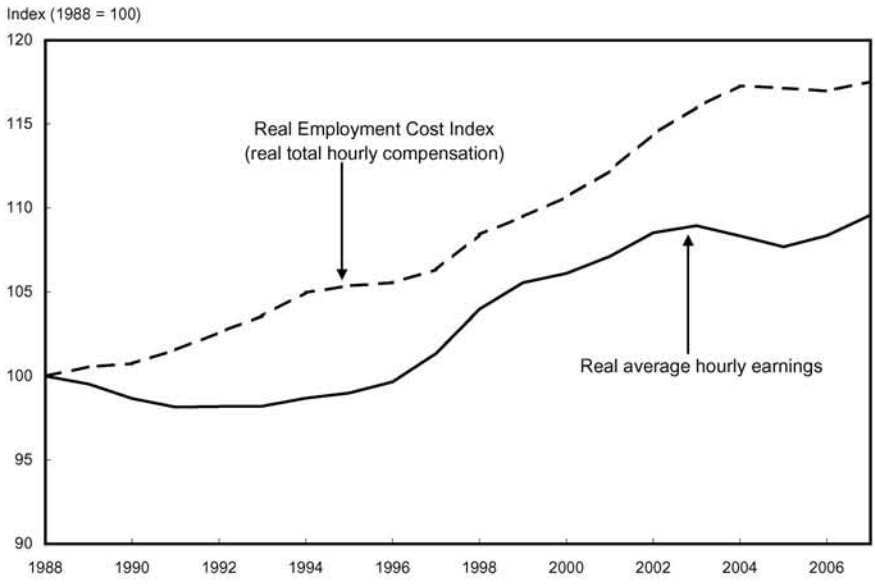
Chart 8-4 reveals one other important point about recent trends in labor income. Workers are increasingly getting less of their pay in terms of cash wages and more in terms of benefits. Real total compensation per hour for private non-farm workers is plotted using the Employer Cost Index, which includes wages, salaries, and employer costs for employee benefits. Again, the index is set to 100 in 1988. Real total employee compensation grew considerably faster throughout the last 20 years than real hourly earnings. In 2007, total employee compensation in real terms reached its highest point on record. The growth appears most pronounced during the first half of this decade. This rise in total compensation likely stems from the growth in the costs of employer-provided health and retirement benefits, which far outpaced the growth in cash wages (and inflation) during the Administration. The increase in the dollar value of compensation received in the form of non-wage benefits has reduced the real wage increases that workers would have otherwise received.

Finally, the real household income decline noted at the start of this section, as well as the changes in worker wages, masks one other important factor. These are pretax measures and therefore are imperfect gauges of what people

and households are able to spend, save, and invest. One measure that looks at after-tax income tells a much different story. Specifically, real per capita disposable income, another important measure of income derived from the Bureau of Economic Analysis's National Income and Product Accounts, reflects after-tax income and is more reflective of purchasing power. From 2000 to 2007, there was a steady increase in per capita real disposable income that averaged 1.68 percent per year, compared with 2.12 percent annual growth in real disposable income over the 8 years from 1992 to 2000. Given the rise in energy prices during the current Administration, however, as well as the fact that there was an economic downturn over its first several years, the growth in real disposable income is noteworthy. Like real median household income, however, real per capita disposable income reflects both labor and non-labor income.

Although 2008 and 2009 will undeniably be difficult for many workers and their families as unemployment rises, data from 2000–2007 show that most measures of real income (that is, labor income, total compensation, and per capita disposable income) grew during the Administration.

Chart 8-4 **Real Hourly Earnings and Real Total Compensation Costs over Time**
Real hourly employment costs (total compensation) have grown faster than real hourly earnings.



Source: Department of Labor (Bureau of Labor Statistics).

Worker Flexibility and Training

The U.S. labor market is part of a dynamic worldwide market with constantly changing demands brought about by technological change and international trade. The U.S. labor market, however, is well structured to meet these challenges. The United States has a long history of limiting the amount of government intervention between workers and firms, thus allowing for flexibility in the American workforce. Specifically, businesses in the United States are less limited than businesses in other developed countries in their ability to discharge a worker, thereby making them more willing to hire workers, knowing that they can more easily fire an unproductive employee. In times of growth, job openings are plentiful and workers are willing to search for the job that best matches them. The flexible employment relationship in the United States is evidenced by the relatively high rate of job mobility. Although it must be recognized that workers do build up specific skills from remaining at a firm and that not all job separations are advantageous, a growing economy still requires that workers be flexible and change jobs to find the correct match for their skills.

Among countries in the Organization for Economic Co-operation and Development (OECD), the United States has by far the most mobile workforce. Since January 2001, about 1 in 30 workers separated from their job in an average month (or about 4.39 million jobs were vacated). During these months, an average of 4.54 million workers were hired each month, suggesting that the economy was both creating new jobs and that workers were quickly filling positions that opened. The majority of job separations during these years were also created by workers voluntarily quitting, suggesting that many workers left jobs for new opportunities. Although these numbers have become more volatile in the latter half of 2008, with layoffs making up a higher percentage of job separations, during times of growth the rate of job openings in the United States is a testament to the relative flexibility of the U.S. labor market.

Workers in the United States have also shown more willingness to move to where jobs are located. According to the OECD, in each year from 2000 to 2005, over 3 percent of the U.S. working-age population moved across State lines. In comparison, only 1 percent of the working-age population in the EU-15 (the 15 European Union members before the 2004 expansion) moved between the 72 recognized European regional subdivisions. Moreover, less than 0.25 percent moved between EU-15 countries annually over this period. Obviously language barriers preclude some EU-15 mobility, but the greater geographic mobility in the United States also compares favorably to Australia and Canada. In short, the willingness of workers in the United States to move is an important part of the structure of the labor force and a reason for its flexibility.

Another key to meeting the growing demand for new and changing skills in the labor force will be the continued willingness of American workers to get the education and training needed to fill the new jobs that are created in the economy. A commitment to education, particularly in more technical fields, will prove to be important in the coming decades. The Administration's job training initiatives, including the Community-Based Job Training Grants and the High Growth Job Training Initiative, have helped prepare workers for jobs in high-demand industries. The Administration also proposed Career Advancement Accounts that put funds directly in the hands of people to pay for expenses related to education and training and put strict limits on administrative overhead in order to increase resources available for job training. Finally, international trade has also created many new opportunities for American workers, and Box 8-2 describes programs aimed to help workers take advantage of these opportunities.

Retiree Income

As life expectancies increase, American workers will likely spend an increasing amount of time in retirement. The Federal Government provides substantial retirement assistance through the Medicare and Social Security programs, but the challenges faced by these entitlement programs are substantial and are discussed in Chapter 6. Private savings and individual pensions provided by employers continue to be essential.

Box 8-2: Trade Adjustment Assistance

International trade brings substantial benefits to the U.S. economy. Not only are American consumers able to take advantage of a greater number of goods at lower prices, but workers in industries whose products and services are in high demand internationally benefit as well. In 2006, for example, an estimated 13 million U.S. jobs were supported by exports. The wages of manufacturing workers in plants that export are 9 percent higher than the wages of workers in non-exporting plants, and the wage premium in service-oriented firms that export is 13 percent over non-exporting firms. Furthermore, exports accounted for approximately 30 percent of economic growth in 2006.

Although the benefits of trade are enormous, workers in industries that must compete with imports can be adversely affected. Because of this, Trade Adjustment Assistance (TAA) exists to provide benefits to workers who are potentially adversely affected by trade. Though

continued on the next page

Box 8-2 — continued

the TAA has been in operation since 1974, it was changed substantially when it was reauthorized in the Trade Act of 2002. The Act consolidated the TAA and the North American Free Trade Agreement (NAFTA) TAA programs, expanded the eligibility to cover workers affected by shifts in production to certain other countries and to workers secondarily affected upstream or downstream from TAA-certified firms, expanded the training opportunities available, provided a health coverage tax credit, and promoted earlier intervention to allow more rapid enrollment, training, and reemployment of eligible workers. In FY 2007, firms covered by TAA certifications employed nearly 147,000 workers. Of these, over 49,000 eligible workers entered TAA training.

Of the eligible workers who took up benefits in the program in fiscal year 2007, 68 percent received some form of training, 59 percent received specific occupational training, and 13 percent received remedial training. The TAA program has also become successful over time in finding new employment for workers. While in 2001 only 63 percent of workers who exited the program were successfully reemployed, with a wage replacement rate of 87 percent, by 2006, 72 percent of workers exiting the program were reemployed, with a wage replacement rate of 89 percent.

In discussions of TAA reauthorization during 2007, debate developed in Congress over potential ways to expand the TAA program. The Administration supported reforms to the TAA to improve the delivery of services, to offer greater flexibility, and to enhance training for eligible workers. Several legislators and policymakers, however, suggested a number of expansions to TAA benefits, most notably: (a) allowing service workers, in addition to manufacturing workers, to receive benefits; (b) allowing workers who produce service-related goods to receive benefits; (c) allowing entire sectors to be eligible for coverage under TAA benefits; and (d) increasing the amount of funding for benefits and training. The fiscal and economic costs of such an expansion were uncertain, and some estimates indicated they would be substantial (the Congressional Budget Office estimated an additional $8.6 billion over the 2008–2017 period). Beyond the fiscal cost, however, there were additional concerns regarding economic efficiency. Extending TAA benefits to substantially more workers could lead to economic losses by creating longer-term, higher unemployment in the covered industries. Furthermore, service workers experience minimal wage loss during displacement when compared with manufacturing workers, indicating that expanding benefits to them may not be justified. Finally, there were worries that expansion would open the door for further, unwarranted expansions of TAA benefits.

Employer-provided pensions come in one of two types: defined benefit plans or defined contribution plans. *Defined benefit pension plans* specify an amount to be paid upon retirement, normally calculated using a formula based on an employee's years of service with the company and his or her earnings history. *Defined contribution pension plans* consist of an individual employee account into which the employer and/or employee contribute, usually at a fixed percentage of the employee's salary. Upon retirement, individuals have access to the balance in the account. Historically, defined benefit plans have been dominant, but over the past several decades, defined contribution plans have become more popular.

The first Federal protections of worker pensions were set by the Employee Retirement Income Security Act (ERISA) of 1974, which, among other things, established the fiduciary responsibilities of plan managers. It also established the Pension Benefit Guaranty Corporation, which protects the defined benefit plans (up to a statutory limit) of private sector workers against the possibility that an employer will fail to pay the promised benefits. The Pension Benefit Guaranty Corporation is funded primarily through premiums established by law paid by the sponsors of defined benefit plans.

There have been many changes in pension provision since ERISA was passed in 1974, including the increased prevalence of defined contribution plans and heightened concerns regarding underfunded private plans. The Pension Protection Act of 2006 accomplished several important goals. First, with regard to defined benefit plans, greater premiums were imposed on companies with underfunded plans. Moreover, caps on the amount employers could put into plans were raised to allow employers to build a cushion during good economic times.

The Pension Protection Act also addressed the growing use of defined contribution plans by including provisions that give workers more information and control over the investment of their account balances. It also provided incentives for employers to automatically enroll new employees in defined contribution plans, which likely will increase plan participation. Furthermore, after observing the potential for notable shortfalls in pension plan funding, the act also improved the process employed to value plan assets and liabilities. By utilizing fair-market valuations, the pension reform was able to limit the use of valuation-smoothing practices that often made it difficult to detect gaps in pension funding, thus helping to prevent funding shortfalls. The various reforms in the Pension Protection Act followed an initiative led by the President in his 2005 pension reform proposal. These reforms will make retirement incomes of millions of Americans more secure.

Looking Ahead

As we look toward the future, there are a number of education and labor issues that will likely receive attention. First, the distribution of income in the United States is more skewed toward the wealthy than in other developed countries. The lower level of intergenerational economic mobility in the United States, compared with other countries, suggests this is a concern that will persist. Second, a need for comprehensive immigration reform exists and will necessarily require education and labor policies to be balanced with border security. The Administration has been a strong supporter of such reform, and the ideas generated by the Administration will likely shape discussions in the years ahead.

Income Inequality

In addition to arguments centered in theories of social justice, high income inequality may create more tangible problems. Some argue that inequality leads to a breakdown in social cohesion, which lowers a population's aggregate health (even holding income constant). Violent crime also increases as gaps between the poor and wealthy widen. Apart from that, high inequality threatens to squander the abilities and talents of a larger number of children in poorer families if upward economic mobility is also low. This is the case in the United States, where intergenerational mobility is relatively low and income inequality is high.

The most common method for measuring income inequality is the Gini coefficient, which is a value that ranges from zero (perfect equality, or everyone has an equal amounts of income) to one (perfect inequality, or all income is held by one family). The U.S. Gini coefficient is currently 0.45, according to the most recent cross-country comparison measures from the Central Intelligence Agency (or 0.46, according to the most recent Census Bureau estimates, which measures U.S. inequality). This level of inequality exceeds that of most other developed countries, with many European nations having Gini coefficients below 0.30. In fact, the U.S. level of inequality exceeds that in some lesser developed countries such as Indonesia (0.36) and is comparable to Kenya (0.45). Only a few countries noticeably exceed the United States in terms of inequality (for example, Brazil (0.57) and South Africa (0.65)). In short, the level of inequality in the United States is unusually high given our level of development and wealth.

In addition to the Gini coefficient of the United States being high by international standards, it has steadily risen over the past several decades. Many researchers have tried to explain the reasons for the high and growing level of income inequality in the United States. Although some have attributed the

greater inequality to institutional factors such as the declining real value of the minimum wage and lower rates of unionization, institutional explanations fail to match some of the more recent trends in inequality that look beyond the Gini coefficient. Specifically, an analysis of the wage distribution of workers suggests that the gap between mid-level earners and low-wage workers has remained relatively steady over the past decade despite a declining real value of the minimum wage. Instead, the gap between the highest earners and mid-level earners has increased over the past decade.

This most recent analysis of trends argues that technological change since the 1990s, particularly in the area of information technology, has benefited workers who possess skills for which these advances are complementary. These include highly skilled workers who are in jobs where technology is used in combination with interpersonal skills, such as in management or professional positions. These jobs are not as easily automated or outsourced as the tasks performed by middle-educated white collar or production workers. Those with less education but wages in the middle of the distribution have seen the difference between their wages and the wages of the highest earners widen.

One way to bring more of the workforce into the group of highly skilled workers whose jobs are not easily automated or outsourced is to provide a greater emphasis on education, particularly in math and science. Recent successes in raising math test scores and expanding the Pell Grant program are important steps. A continuing focus on increasing educational attainment for children across the income distribution is critical. Increased access to quality education will create more productive workers and greater wages for an increasing share of the population, thereby closing income gaps.

Immigration Reform

The United States is a nation of immigrants and has long depended on the contributions of the foreign-born to its economy. A sound immigration policy must continue to foster the economic benefits of immigrants by recognizing that foreign-born labor complements the existing strengths of the U.S. workforce. Such an immigration policy should also promote fluency in English, which not only enhances the earnings potential of immigrants but also can help improve productivity. Furthermore, the flow of immigration must also be regulated and restricted to legal channels.

Residents of foreign countries will immigrate when the benefits of migration outweigh the costs. The benefits typically are the earnings differentials between the United States and their home country. Because of this, the United States usually attracts immigrants of all skill levels. The highly skilled

are attracted to the greater earnings they receive in the United States given their skill level. Immigrants with fewer skills are attracted to the better wages and potential opportunities for their families.

The United States benefits from both types of immigration. The scientific establishment and high-technology industries have long benefited from workers with superior skills who immigrate to the United States and boost productivity. Immigrants with fewer skills perform jobs that complement existing labor in this country.

Education and labor policies have their roles in a comprehensive approach to immigration policy in the United States. While many immigrants are highly skilled, the average educational attainment of immigrants lags behind the native-born. Promoting English fluency is important because it increases labor market opportunities for immigrants, boosts their productivity, facilitates higher earnings, and promotes greater assimilation. To enhance the potential contribution of immigrants and to improve their well-being, it is also important to continue this Administration's sound education policies. NCLB, Reading First, and policies that increase access to higher education are all targeted toward students that need the most assistance, and the U.S. immigrant population stands to gain much from these programs. The U.S. economy will benefit in turn.

The issues the United States confronts with regard to its immigration policy are complex, and the Administration introduced comprehensive immigration reform as part of its domestic policy agenda in 2004. This proposal addressed many issues, including devoting more manpower to border security and increasing worksite enforcement of immigration laws. To ensure that the United States has an immigrant workforce that complements the existing U.S. workforce and meets economic needs, the Administration called for a flexible temporary guest worker program. To improve the productivity of immigrants, enhance their contributions to U.S. labor markets, and improve their welfare, assimilation proposals that promoted English and cultural literacy were advanced. The sweeping reforms of this proposal, however, failed to gain the necessary Congressional support. The need for these immigration reforms endures, and the Administration's plan remains one that is sound in terms of both securing borders and promoting economic progress.

Conclusion

The Administration has been committed to ensuring that the U.S. labor force remains productive for decades to come. Significant progress has been made in the U.S. educational system to help current and future students meet the ever-increasing and changing demand for skills in the more global,

competitive labor market. K–12 education has improved, test scores are rising, and students in underperforming schools now have more education options. Also, access to the U.S. higher education system has improved through expansions of the Pell Grant program and reforms enacted in the student loan program. Despite these successes, there are challenges that remain. Income inequality in the United States is high and suggests that a continued emphasis on education is necessary to raise the incomes of those in the lower half of the income distribution. Also, education and labor policy will need to be part of comprehensive immigration reform in the United States. This reform must reduce illegal immigration while continuing to allow the U.S. economy to benefit from legal immigrants.

CHAPTER 9

Economic Regulation

The United States relies on the private sector to organize most economic activity. Through price signals and competition, markets allocate scarce resources to their highest-value uses, encourage businesses to avoid waste, and create incentives to invest in new technologies. Government plays a vital role in a market system by guaranteeing property rights and enforcing contracts, meaning that businesses and individuals can invest and trade with confidence that their agreements will be honored and free from fraud. A private enterprise system supported by consistent enforcement of laws protecting property and contracts has been at the heart of the American economy's tremendous prosperity and growth.

Although free markets produce the most efficient outcome in most cases, there are markets in which government intervention can increase economic efficiency. A *market failure* is an instance in which unregulated markets yield an outcome that is inefficient from society's point of view. As discussed in Chapter 2, regulation is important in financial markets because of imperfect information; for example, investors often have far less information about the firms they invest in than the managers who control those firms. Chapter 3 discusses the role of regulation when production of a good creates a *negative externality*, such as environmental harm, that does not represent a cost from the producer's perspective but imposes a cost on society. Regulation can mitigate the costs of negative externalities by ensuring that consumers and producers bear the full cost of their activities. Regulation can also reduce harm from *natural monopoly*, which occurs when a single seller can produce a good or service more cheaply than a competitive industry. In the presence of natural monopoly, an unregulated market will yield output levels that are too low and prices that are too high from society's perspective. In cases like these, where there is a specific market failure that can be effectively addressed by the government, regulation may be able to improve economic outcomes.

When unregulated markets produce inefficiencies, however, government is not always effective in eliminating or reducing the inefficiencies. There are several reasons that government is often inefficient in carrying out regulation. First, competitive market prices, which efficiently coordinate decisions in competitive markets, are unavailable where market failures have caused inefficiencies. The lack of reliable price information makes it difficult for government to design effective regulation. Second, government does not face market incentives to keep costs low and to use resources in the most efficient way possible. Third, government decision making reflects the results

of a political process in which decision makers may be motivated by narrow interests rather than the broader goals of society. Market participants may spend resources on attempts to influence the political process, when other uses of resources would produce greater public benefit. These factors mean that government intervention can have significant costs, which must be weighed against the potential benefits of addressing market failures.

One way government can mitigate these problems is by designing regulations that take advantage of markets or market mechanisms whenever possible. "Command and control" regulation, which replaces decentralized market choices with centralized decision making by government officials, exacerbates the three problems identified above. Regulation that relies on market mechanisms, however, can take advantage of individuals' information about costs and benefits, give individuals the incentive to make socially efficient decisions, and reduce the ways that narrow interests can influence policy choices.

This chapter reviews several areas in which markets have been affected by government policy in the past 8 years. The Administration has pursued market-oriented policies that favor individual choice over government decision making and has supported new rules when needed to address identified market failures. The Administration has also considered the effectiveness of the overall regulatory structure for financial markets in particular, a summary of which is provided in Chapter 2. The key points of this chapter are:

- Regulation is appropriate when, and only when, there is an important market failure that can be effectively addressed by the government. For example, the Administration has taken steps to reduce restrictive regulation of broadband markets, preserving an environment conducive to innovation and new investment. Conversely, the Administration supported new rules for financial reporting when it became clear that existing laws did not adequately reduce information asymmetries between investors and management.
- When the government intervenes to address market failures, it should attempt to take advantage of market-based incentives whenever possible. The Administration has helped ensure that scarce spectrum licenses are allocated more efficiently by increasing the amount of bandwidth allocated through auctions rather than through arbitrary allotments. In transportation, the Administration has supported market-based approaches to financing infrastructure such as roads and the air traffic control system.
- The Administration has endeavored to ensure that, when the government does intervene in markets, it does so in a way that supports the operation of competitive markets. When the market for terrorism insurance was disrupted following the attacks of 9/11, the Administration supported a temporary program of Federal support for terrorism insurance, and

the Administration has insisted that subsidies be phased out as private insurers adapt and return to the market. By supporting tort reform, the Administration has helped reduce the scope for class action lawsuits that create costs that outweigh their social benefits.

Telecommunications and Broadband

Digital technologies and the Internet are rapidly changing the market for telecommunications. Much of our system for regulating telecommunications, however, is designed to address local monopolies in telephone service. Regulation that was well suited to markets based on prior technologies should be revisited as markets change. Particularly when innovation is transforming an industry, outdated regulations can hamper investment and prevent new products and services from developing in the way that best serves consumers.

Governments regulate local telephone service because it has long been considered a natural monopoly. It is expensive to build and maintain a network of lines to homes and businesses, but once the lines are in place, the extra cost of providing each call is small. This means new entrants would find it very hard to challenge an incumbent phone company. A potential competitor would need to invest large amounts to duplicate an incumbent phone company's network of lines, and resulting competition would make it hard for either firm to charge rates high enough to pay for the investment. To prevent incumbent phone companies from charging monopoly prices, government regulates rates for local phone service. In addition, the Federal Government attempts to encourage competition in local service by requiring incumbent phone companies to make their lines available to competitors and by regulating the price for access to their lines.

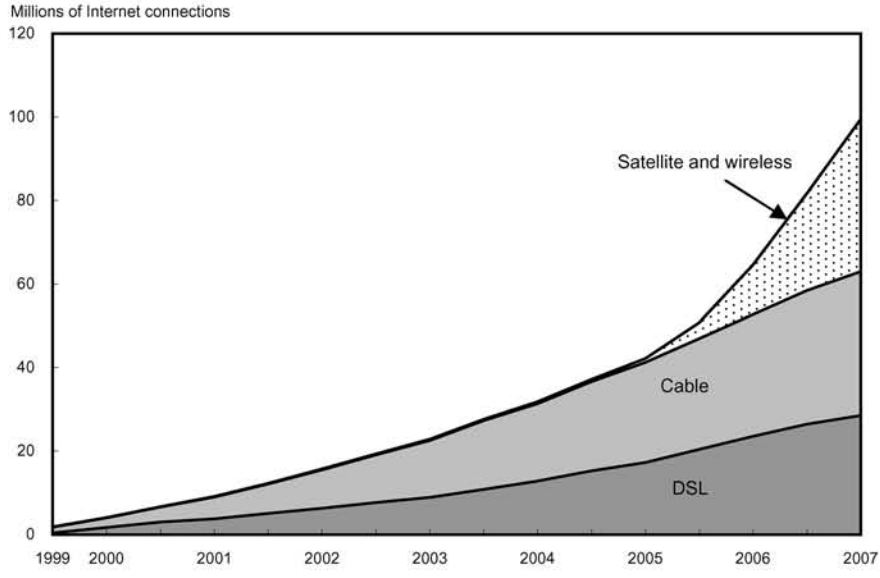
New Technologies Permit Greater Competition in Telecommunications

New technologies are changing the telecommunications market. A new market has developed in *broadband* Internet connections that can transmit data at high speeds. Broadband data can be delivered along the same physical lines that carry telephone signals, but can also be delivered via cable, via fiber optic connections, wirelessly via "third-generation" networks or satellites, or via newer technologies such as broadband over power lines. Because digital signals can be delivered in a variety of ways, the broadband market is more open to competition than the traditional phone system, which required copper wires connected to every home.

Unlike local phone service, for which Americans traditionally had only one provider available, the large majority of Americans can now choose among competing broadband providers. As of June 2007, 99 percent of U.S. ZIP codes had access to two or more high-speed Internet service providers, and more than three-quarters of ZIP codes were served by five or more providers. The price of broadband service has fallen in real terms even as the average broadband connection has become more advanced. Chart 9-1 shows that the total number of subscribers has grown dramatically, with an increasing variety of technologies used.

These same digital technologies, combined with large investments in wireless telephone networks, mean that consumers have new choices for local telephone service, a market situation that undermines the traditional arguments for regulation in local telephone markets. Between 2002 and 2006, the number of households that use a wireline for their primary phone connection fell from 102 million to under 90 million, and the number of "wireless-only" households increased from 2 million to 19 million. That new competitors are challenging the longstanding monopoly position of local telephone providers raises questions about the best approach to regulating local telephone service going forward.

Chart 9-1 **High-Speed Internet Lines in the United States by Type of Connection, 1999–2007**
Broadband connections have grown rapidly.



Note: Fiber and powerline connections are a small fraction of connections and have been omitted.
Source: Federal Communications Commission.

Telecommunications Regulation in an Evolving Market

The Administration's approach to broadband regulation has recognized that a dynamic and competitive broadband market should not be governed by rules designed for monopoly telephone services. That does not mean that no rules are appropriate. Broadband companies should disclose the policies they use in managing their networks; if consumers know what they are getting, competitive pressures will offer the most effective means of providing consumers with low prices and high-quality service. However, prescriptive regulation of a growing, dynamic market carries two risks. First, because the market continues to evolve, a regulation aimed at temporary or hypothetical problems may cause permanent harm by preventing new and innovative ways of delivering service. Second, regulations that make it harder for broadband providers to price or manage their networks effectively may lower the incentives to invest in new capacity, ultimately harming consumers.

Following the principles outlined in the previous paragraph, the Administration has supported policies that avoid unwarranted regulation of the broadband market and encourage private sector investments in the market. In a series of decisions, the Federal Communications Commission (FCC) determined that broadband service providers would not be regulated as a local phone service; in particular, they are not required to make their high-speed lines available to competitors at a regulated price. While government-mandated access can facilitate competition between a large incumbent provider and potential competitors, applying it to an emerging industry that features competing technologies would have risked undermining incentives to invest in new capacity. In fact, the private sector has invested more each year in building broadband networks, in real terms, than the Federal Government invested annually in the Interstate Highway System in the 1950s. These investments in turn have meant more options for consumers, and ultimately more competition in the broadband market.

There is certainly a role for telecommunications regulations that target specific failures in the telecommunications market. For example, 911 services provide external benefits by making it more likely that emergencies are promptly reported to emergency services. The Administration supported the FCC's efforts to ensure that 911 services are available for subscribers of Voice over Internet Protocol telephone providers. When there is a role for regulation, the rules should facilitate competition and consumer choice whenever possible. In implementing the "Do Not Call" list, for example, the Federal Trade Commission did not dictate a market outcome but created a way for people to decide whether they wanted to receive certain telemarketing calls (see Box 9-1).

Box 9-1: The Do Not Call List

Telemarketing can be an effective way to inform people about products and services, but it generates a negative externality by wasting the time of those who are not interested in the product being sold. Although the harm from each call may be small, many consumers have found the aggregate externality to be quite large. The policy behind the Do Not Call list is to permit consumers to decide for themselves whether the benefits of telemarketing calls outweigh the costs. Individuals who do not want to receive calls simply add their phone numbers to a central registry, and telemarketers must delete any numbers listed in the registry from those they plan to call. The program has proved quite popular: as of 2007, according to one survey, 72 percent of Americans had registered on the list, and 77 percent of those say that it made a large difference in the number of telemarketing calls that they receive (another 14 percent report a small reduction in calls). Another survey, conducted less than a year after the Do Not Call list was implemented, found that people who registered for the list saw a reduction in telemarketing calls from an average of 30 calls per month to an average of 6 per month.

Spectrum Policy

Since the 1920s, the U.S. Government has required a license of anyone who transmits radio signals on most frequencies. Radio communication works by transmitting a signal on a specific frequency of the electromagnetic spectrum. Mandatory licensing prevents *interference*: when multiple signals are broadcast on the same frequency, it is difficult to receive any of those signals clearly. Interference is an example of an externality, because when one person decides to broadcast a signal, he or she does not take into account the harm this causes to people who are attempting to send or receive other signals on the same frequency.

While licensing addresses the externality problem, it puts the government in the position of allocating a scarce and valuable resource. Given spectrum's value, it is important to allocate it efficiently. Radio waves can be used in many different ways: for two-way communication, to broadcast radio or television programs, and for radar, among other uses. The more spectrum is set aside for broadcast television stations, for example, the less spectrum is available for wireless phones. The challenge of spectrum licensing is to ensure that spectrum is divided among competing uses in the way that creates the greatest benefits to society.

Ordinarily, markets allocate scarce resources using prices, ensuring that resources are dedicated to their highest-value uses. For many decades, however, the U.S. Government awarded spectrum licenses through an administrative process, deciding both how spectrum would be used and who would be allowed to use it. Prospective users submitted applications to the FCC, and the FCC attempted to identify the applicant who would offer the greatest public benefit.

The optimal allocation of spectrum, however, depends on information not easily available to government, from technical information about how much spectrum is needed to effectively carry out different activities and how that is likely to change in the future, to questions about the value to consumers of the various services that require spectrum. Administrative assignment of licenses also gives firms no incentive to find ways to use spectrum more efficiently, because they cannot change their method of transmission and cannot sell or lease unused capacity to others who would use spectrum in a different way.

The United States began using a more market-oriented approach to allocating spectrum rights in 1994 with the first auctions of radio spectrum for use in wireless phones. In the auctions, the FCC announces the portion of the spectrum for which licenses will be made available, and all interested parties are invited to submit bids. By 2008, the FCC had held more than 70 auctions that raised tens of billions of dollars for the Federal Government. More important than the revenue, however, is that auctions ensure that spectrum will go to those who are able to use it in the most efficient way. When one company outbids others, it generally means that the winner believes it can produce more value using that spectrum, by using it more effectively or in a more innovative way than its competitors. Instead of a government evaluation of which applicant is best able to use spectrum to serve the public, the bidding process allocates licenses based on what companies reveal about the benefits they can actually produce.

The Administration has worked to increase the role of auctions in allocating spectrum. Most spectrum remains under licenses granted long ago; as of 2001, less than 7 percent of the most valuable spectrum was available for allocation through market mechanisms. One obstacle to reallocating spectrum is that incumbent license holders have a strong incentive to retain spectrum they use, even if others might be able to use it more efficiently. One way the Administration has tried to overcome this obstacle is by making it easier for incumbents to transfer their spectrum to others. In October 2003, the FCC established new procedures for holders of existing licenses to more easily sublicense their spectrum to third parties, helping to foster secondary spectrum markets. More broadly, the Administration has supported policies under which incumbents are compensated as part of a process that reduces the total amount of spectrum they use. Two major spectrum auctions using

this general approach since 2001 have freed up significant bands of spectrum, nearly doubling the amount of spectrum allocated through auctions for wireless use.

In early 2008, the FCC held an auction to allocate spectrum that will be vacated when the United States makes the transition to digital television broadcasting, pursuant to the Digital Television Transition and Public Safety Act of 2005. Digital signals allow broadcasters to transmit television programming more efficiently, so that the spectrum that was used to broadcast a single analog television channel is now able to carry multiple digital channels. One result of the transition is that spectrum that was previously used for channels 52 to 69 (between 698 and 806 megahertz (MHz)) will become vacant. Television stations using other frequencies will be able to transmit using digital signals. Much of the newly vacated spectrum was auctioned for wireless communications use.

In December 2004, the President signed the Commercial Spectrum Enhancement Act, which created a mechanism for transferring spectrum from government use into the private sector. Government users of these frequencies were given the opportunity to switch to other parts of the spectrum, with the transition costs (including new equipment) paid for using a portion of the auction proceeds. Under the Act, the reallocation of spectrum was not to take place unless the auction raised sufficient funds to compensate the affected agencies. In fact, auction revenues were several times what the agencies had reported was necessary to compensate them for the switch. The large difference between the market value of spectrum and the costs of the transition demonstrate the large efficiency gains available from reallocation of spectrum. Together with the transition to digital television, the Commercial Spectrum Enhancement Act has freed up 152 MHz of spectrum to be auctioned for wireless communications use, and all but 10 MHz had been auctioned by 2008. This represents an increase of 80 percent over spectrum available for mobile telephones at the beginning of this Administration.

The President's Spectrum Policy Initiative for the 21st Century, which was announced in 2003, requires a studied look at the current spectrum management policies and practices in the United States. As part of this program, the Commerce Department's National Telecommunications and Information Administration has worked to establish or expand incentives for promoting efficient spectrum use by the private sector as well as Federal agencies, using market-based approaches wherever appropriate. Areas of particular interest have included revising the traditional "command and control" management of Federal spectrum, developing user fees that reflect market worth, and creating property rights that would permit spectrum trading.

Tort Reform

Even when businesses are not regulated directly by the government, they face the possibility of being sued under the tort system. "Tort" refers to the body of law that permits individuals to sue others, seeking compensation when they have been accidentally or deliberately injured. Many tort suits arise from harms involving strangers, such as automobile accidents, but an important class of torts arises when buyers of a good or service sue the seller in response to harm related to the purchase of the good or service.

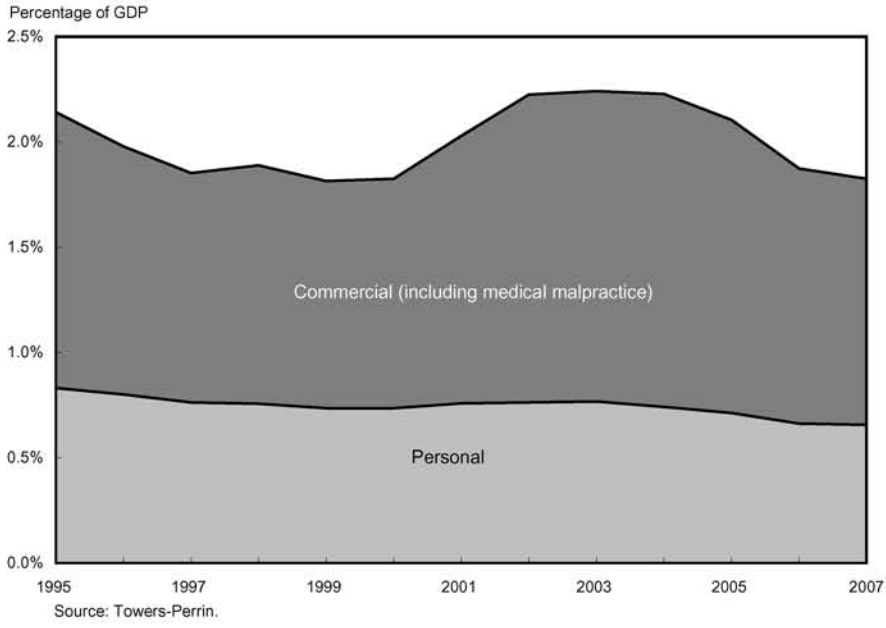
Tort law can be a response to the market failure of imperfect information. Buyers often cannot tell ahead of time whether a product is safe or a service provider is qualified. By providing buyers with redress when a product or service they buy causes harm, tort law can encourage sellers to exercise appropriate care and to make sure buyers are getting what they expect when they enter into a transaction.

Like more direct forms of government regulation, tort law establishes rules that firms must follow to avoid being penalized. Tort law can increase sellers' incentives to provide safe, high-quality products and services. It also compensates victims of some accidents, providing a form of insurance when an accident is caused by another's negligence. However, the tort system is an expensive form of regulation, and tort law can be abused in ways that make its costs to society greater than its benefits. One study found that out of each dollar of costs in the tort system, only 46 cents goes to compensating plaintiffs for their losses. This makes the tort system much more expensive to administer than other systems that compensate victims for unexpected losses, such as worker's compensation.

Total tort costs represent a significant part of U.S. economic activity. Tort costs in 2007 totaled $252 billion, or 1.83 percent of gross domestic product (GDP), including damages paid to compensate plaintiffs, costs of defense, and administrative costs. As shown in Chart 9-2, more than half of tort costs come from lawsuits against businesses (including doctors) as compared with personal lawsuits such as automobile accidents.

The Administration has worked to reduce the scope of lawsuits in areas where costs often outweigh benefits. A type of lawsuit that may be especially susceptible to abuse is the class action suit, in which a single suit is filed on behalf of a large number of plaintiffs with the claim that everyone in the class has been harmed by the defendant. Class actions can be efficient in some cases in which a large number of people have suffered a similar type of harm, because they eliminate the redundancy of multiple courts exploring similar sets of facts, and because absent a class action, each individual may have little incentive to bear the costs of a lawsuit. A potential problem with class action lawsuits, however, is that plaintiffs' lawyers may have incentives that are not

Chart 9-2 **U.S. Tort Costs, 1995-2007**
Tort costs as a percentage of GDP have moderated in recent years.



Source: Towers-Perrin.

aligned with those of their clients. Because individual plaintiffs may not have a large stake in the outcome, they may not effectively monitor their attorneys, and plaintiffs' attorneys may negotiate a settlement with the defendant that works well for the attorneys but does not represent meaningful redress for the people actually harmed.

In 2005, the President signed the Class Action Fairness Act, which contained provisions aimed at reducing the number of abusive class action lawsuits. An important set of reforms addressed "coupon settlements," one arrangement that may often serve the interests of defendants and plaintiffs' lawyers at the expense of plaintiffs themselves. In a coupon settlement, members of the affected class receive coupons that can be redeemed for discounts on the defendant's product, but attorneys receive what may be a very large cash payment based on the nominal value of the coupons. For example, in one case, plaintiffs alleged that a video rental company had failed to disclose its late-fee policy. Members of the class received coupons worth $1 off a future rental, while the plaintiffs' attorneys received a fee of $9.25 million. Experts estimated that at most 20 percent of the coupons would be redeemed. Moreover, it is plausible that the coupons were more effective as a marketing effort by the defendant than as a deterrent to poor disclosure policies. The Act reduced possible abuse of settlements through

a number of reforms, including instructing courts to scrutinize settlement agreements more carefully and a requirement that attorney fees be based on the value of coupons actually redeemed, rather than coupons issued.

The Act also took steps to curtail "forum shopping"—that is, efforts by plaintiffs to choose a jurisdiction that they expect will be friendly to their case. Lawsuits are generally tried in a jurisdiction that has some connection to the parties, but because class actions often include a large number of plaintiffs nationwide, attorneys had the opportunity to initiate a lawsuit in a location where they felt either the court or the local jury pool would be most favorable to their case. The Class Action Fairness Act addresses this issue by making it easier for defendants to have their case heard in Federal court, reducing opportunities for plaintiffs to shop around for a jurisdiction in which they are likely to have an advantage.

Corporate Governance Reform

For small businesses, a firm's owner is likely to be its manager. But large corporations may be owned by thousands of shareholders at once, and such a large, dispersed group must delegate management to a smaller group of people. This separation of ownership and control makes it possible to maintain central control over a firm's operations while raising the large amounts of capital needed for many corporate investments. But it also introduces the problem of ensuring that managers make decisions that are in the best interests of the shareholders. Corporate governance refers to the systems through which shareholders are able to control the choices of those who manage the firm on their behalf.

Regulation of corporate governance arises from the fact that managers know more about the corporation's situation than the shareholders on whose behalf they are making decisions. Most shareholders would like the corporation's managers to make decisions that maximize profits. To encourage this, corporate boards attempt to design incentives that reward managers when their actions increase profits. For these incentive systems to work, however, they must be based on accurate financial reports that are generated in a transparent way.

A corporation will be better off if it can ensure accurate financial reporting, because if investors doubt the information they receive, they will be less willing to invest. But it is difficult for shareholders to observe the mechanisms that a corporation uses to improve accuracy and to prevent management from making misleading reports. Furthermore, shareholders are a large, dispersed group, so that an individual shareholder will not receive the full benefit of costly efforts to monitor management. In the face of these challenges to

private monitoring of financial reporting, the U.S. Government attempts to ensure the accuracy of financial reporting through the securities laws enforced by the Securities and Exchange Commission (SEC).

Beginning in the late 1990s, an increase in earnings restatements and some large accounting scandals at major companies led to concerns that corporations had been misleading investors about the extent of their profits. In March of 2002, the President proposed a plan to improve corporate governance, centered on three principles: accuracy and accessibility of information, management accountability, and auditor independence. Congress later passed the Sarbanes-Oxley Act of 2002, which incorporated these three principles by introducing a number of changes to U.S. securities laws. Some of the key reforms are described in the following paragraphs.

To promote greater accuracy and accessibility of information, Sarbanes-Oxley requires corporations to disclose more information about internal control structures and the members of their audit committees. It also significantly increases the penalties for criminal fraud, increasing the maximum term for securities fraud to 25 years in prison and permitting terms of up to 20 years for destroying documents.

To promote greater management accountability, Sarbanes-Oxley requires chief executive officers and chief financial officers to certify the accuracy and completeness of financial reports that they file with the SEC and makes it a criminal offense to knowingly certify a false report. In addition, executives must forfeit any bonuses or other incentive compensation to which they would have been entitled during the year after a false report is issued.

To increase auditor independence, the Act creates the Public Company Accounting Oversight Board, which oversees the firms that audit corporations' financial reports. The Board conducts regular reviews of accounting firms' activities, and if it discovers problems it can impose sanctions and can bar a firm from providing audit services to corporations listed on U.S. securities exchanges. In addition, the Act creates new requirements to ensure that accounting firms are more independent of a corporation's management. Accounting firms are no longer permitted to sell certain non-audit services to their corporate audit clients, and a company's accountants must be chosen by a committee of directors who have no ties to management.

Since passage of the Sarbanes-Oxley Act, many have expressed concern about the cost of compliance with its requirements. There is evidence that some firms, especially smaller firms and foreign firms, have chosen to cease or to avoid trading on U.S. public markets because of the expense of complying with Sarbanes-Oxley, although there is no definitive evidence on how large this effect has been. While some increase in costs is the inevitable result of stricter reporting standards, it is important to ensure that the increased costs are justified by greater accuracy and transparency. Many of the specifics of Sarbanes-Oxley depend on rules and standards under the control of the SEC

and the Public Company Accounting Oversight Board. As regulators and corporations become more familiar with the implementation of the Act, and as reporting companies adapt their practices and regulators adjust rules to eliminate inefficient requirements, the costs should fall.

Insurance Against Terrorism and Natural Disasters

When disasters occur, such as the terrorist attacks of September 11, 2001, or hurricanes such as Katrina in 2005 or Ike in 2008, the government plays an important role in providing emergency relief and helping communities to recover. At the same time, insurance coverage is vital in helping individuals and businesses recover from catastrophic events. Most insurance is provided by the private sector, regulated to make sure that insurers are able to repay claims if they come due. But disaster relief acts as a form of public sector insurance, and this means that the market for insurance against catastrophic events is inevitably affected by government policy. To preserve private insurers' important role in mitigating disasters, government disaster relief should help the Nation recover from major losses without discouraging the operation of private insurance markets.

Insurance markets give individuals and businesses a way to reduce risk. For example, anyone who owns a building faces a small risk of losing property in a fire. Rather than accepting a small probability of suffering a large financial loss, insurance allows one to substantially reduce this risk by paying a regular fee, called a *premium*, in exchange for compensation for some or all of the losses sustained in the case of a fire. Because only a small fraction of the population will suffer a fire in any given period, the premiums from the overall pool of insured people provide funds to pay for the damage suffered by those few who do suffer fires.

Insurance markets work most effectively if premiums are tailored to risks that are observable or can be controlled by the insured customer. If individuals with different risk profiles are grouped together and charged the same premium, then those who in fact have low risks are being charged premiums that are greater than the expected value of their losses and may choose to go without insurance. Differences in premiums can also lead individuals to make more efficient choices about what risks to take and how best to mitigate risks—for example, if driving a safer car means paying lower insurance premiums, people will have an incentive to choose safer vehicles. Similarly, it may be more expensive to live in some coastal areas because a high risk of storm damage leads to higher insurance premiums. This means that when

home buyers decide whether to live in those areas, they will take into account the extra cost associated with potential storm losses.

For risks such as house fires or automobile accidents, the fraction of the population that will suffer losses each year is relatively stable. This means that insurers can feel reasonably confident about what level of premiums will be sufficient to cover the year's losses. Losses from major catastrophes are much more difficult to predict—for example, flood losses in 2005 related to Hurricane Katrina were many times larger than the annual flood losses from preceding years. This creates the risk that total losses in a year will be greater than the funds available to the insurer to pay claims. Insurance companies address this risk by purchasing *reinsurance* for large losses: in exchange for premiums, reinsurers agree to bear a fraction of insurer's losses if those losses exceed a certain amount. Because reinsurers typically diversify their risks internationally, they are in a position to pay claims arising from catastrophic losses in a single country.

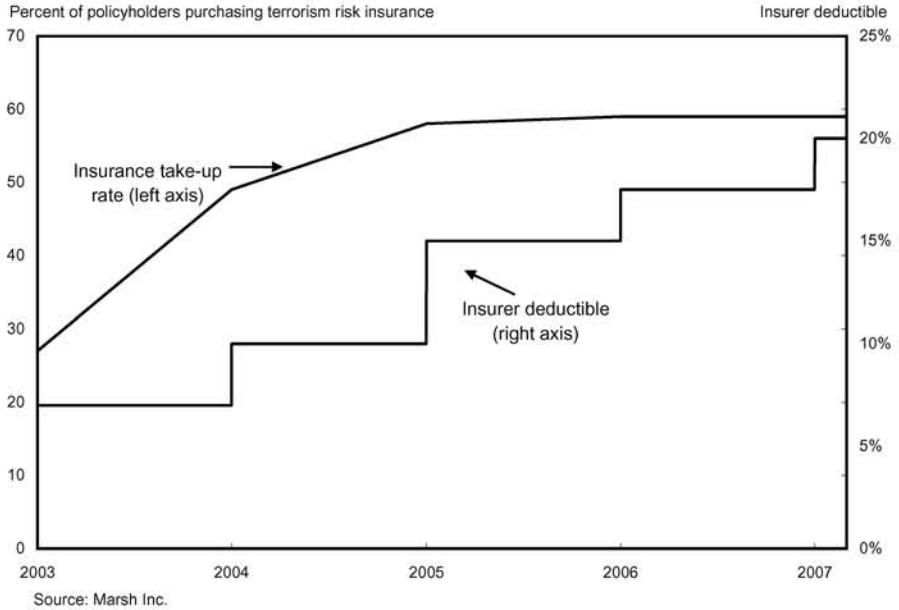
The 9/11 attacks seriously disrupted the market for terrorism insurance. Prior to the 9/11 attacks, the risk of terrorist attacks was covered by most commercial insurance policies. In the months following the attacks, however, insurers were forced to reassess the likelihood of potential terrorist attacks and the capital reserves they would require, and many insurers began excluding terrorism risk from commercial insurance policies. Congress passed the Terrorism Risk Insurance Act (TRIA) to address this disruption in the market and to help reassure businesses that they could obtain insurance against the commercial risks associated with the threat of terrorism. Under TRIA, the U.S. Government provides reinsurance for terrorism losses: in the event of a claim for terrorism-related losses, an insurer would pay the claim to the insured party and then be compensated by the Government for a large share of the losses above certain limits. Insurers do not pay premiums up front for this reinsurance. Instead, TRIA specifies that assessments from insurers would be made after the fact.

TRIA was intended to address a sharp temporary disruption in insurance markets, not to be a long-term subsidy to insurers that provide terrorism coverage. Providing insurance at subsidized rates reduces the efficiency of the insurance market. First, it undermines the incentive effects of premiums that reflect expected losses as discussed above. This can encourage people to undertake risks that they would otherwise not be willing to bear and discourages people from taking actions that would mitigate risk. Second, government-provided reinsurance undermines the private market for reinsurance, discouraging innovation and efficient pricing of risk.

Because of these problems with government-subsidized insurance, the Administration has insisted that TRIA should be a temporary program and that subsidies should be reduced as markets adjust to the post-9/11 environment. The subsidies provided by TRIA have gradually been reduced. The insurer's deductible was initially 7 percent of the insurance company's previous year's premiums, and this fraction had been increased to 20 percent by 2007. In addition, the Federal share of insured losses has been reduced from 90 percent to 85 percent, and as of 2007, Federal payments will not be made unless insured losses from a terrorist event exceed $100 million. The program is scheduled to expire in December of 2014.

The market in terrorism insurance has grown since 2002, even as subsidies for terrorism insurance have been reduced. As shown in Chart 9-3, the fraction of policyholders purchasing terrorism insurance increased from 27 percent in 2003 to 59 percent in 2007, even as deductibles for the Federal reinsurance program were increasing. As the private market develops to accommodate the post-9/11 environment, government assistance should be eliminated to allow the market to operate efficiently.

Chart 9-3 **Terrorism Risk Insurance (TRI) Deductibles and Take-up Rates 2003–2007**
TRI take-up has increased as deductibles have risen and Federal payout shares have fallen.



Source: Marsh Inc.

Roads

The Nation's roads are built and maintained primarily by State and local governments; the Federal Government's role has been to help fund these activities. Like some other infrastructure projects, roads are often natural monopolies: once a road is constructed, it is usually less expensive to accommodate extra traffic on that road than to construct a competing road. But rather than organizing roads under a regulated, private sector monopolist, the government generally owns and operates the roads itself—at least in part because of the expense that would be involved in limiting access to roads to paying drivers and collecting revenue from road users.

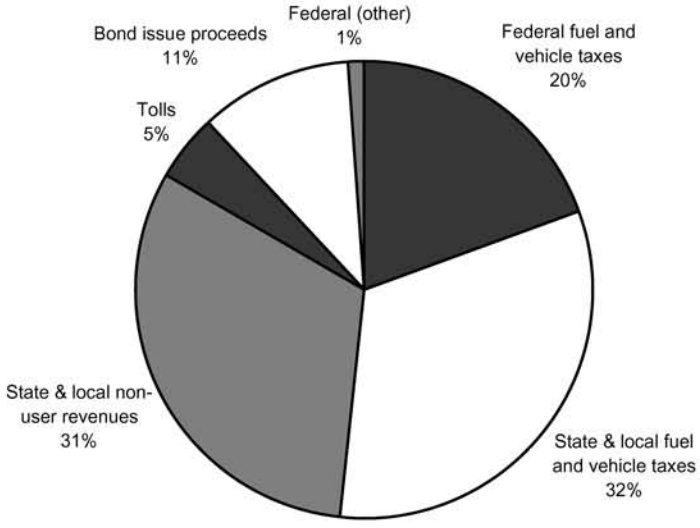
When government provides a service itself to an identifiable subset of society, it is often most efficient to pay for the service through user fees that reflect the *marginal cost* of providing it—that is, the extra cost created by each user. This approach, when practical, both ensures that the service will be used when its value is greater than its costs and provides information about whether and when capacity should be expanded. User fees that reflect marginal costs will lead drivers to make efficient decisions, choosing to drive when the benefits they receive are greater than the costs their trip generates.

On an uncongested road, the marginal congestion imposed by each driver is very small, and fees that reflect marginal cost may often be insufficient to pay the fixed costs of building and operating the road. In this case, the goal is to finance roads in a way that does as little as possible to discourage efficient road use. When a road is congested, however, each trip adds to the delays experienced by other drivers, meaning that the marginal cost of each trip can be quite large. As discussed below, efficient user fees will reflect these congestion costs.

Broadly speaking, roads in the United States are financed in one of three ways: through general revenues such as property or sales taxes, through fuel taxes and other vehicle fees, and through tolls. Chart 9-4 shows that about a third of expenditure on roads is raised through taxes unrelated to road use, largely at the State and local level. About half is raised through fuel and vehicle taxes, and only about 5 percent through tolling (11 percent is funded through bond issues that will be repaid from one of these three revenue sources). Almost all Federal expenditure is funded by fuel and vehicle taxes, reflecting an early decision that the Nation's Interstate Highway System should be funded by the drivers who benefit from it.

One advantage of funding roads with fuel taxes rather than general revenues is that they approximate a user fee: roads are paid for by those who use them, and on average people who drive more contribute more of the cost of providing the roads. However, fuel taxes do not do a good job of capturing the marginal cost of using the road. One of the most important

Chart 9-4 **Highway Expenditures by Revenue Source, 2006**
Fuel and vehicle taxes represent just over half of highway revenue.



Source: Department of Transportation (Federal Highway Administration).

costs associated with road use is congestion: when a driver uses a congested road, she or he increases the delays experienced by everyone else. The increased delay is a negative externality, because each driver does not take into account these costs when deciding when, where, and whether to drive. The fuel tax fails to account for this negative externality, because drivers pay the same amount whether driving on an urban highway at rush hour or on an empty rural road. Many economists point out that fuel taxes can be effective in addressing some negative externalities directly related to fuel use, such as environmental degradation and petroleum dependence. But this does not imply that fuel taxes are the best way to finance roads. In fact, as vehicles become more fuel efficient, they will produce less revenue for each mile driven, so that the same amount of driving will contribute less and less highway revenue.

The Administration has supported exploring ways to begin moving away from fuel taxes toward forms of direct pricing, such as tolls, that would be more effective at matching what drivers pay to the costs they impose. Not only are tolls independent of a vehicle's fuel efficiency, but they also have the flexibility to address congestion externalities because they can be adjusted according to time and place, so that drivers pay more to travel on busy routes

or during busy times. Such tolls encourage drivers to drive at times and places where they will contribute less to the delay experienced by others on the road. Furthermore, tolls that reflect how busy a road is can provide information about how much drivers are willing to pay to use each road. This information can help improve decisions about new investments, by providing objective measures of how valuable roads are to drivers.

By linking revenue to particular road projects, tolling can facilitate private investment in building and maintaining roads. This increases the likelihood that investments will be based on a careful analysis of a project's benefits and costs. When funding is controlled by the government, decisions about road investments are likely to be influenced by a political process that takes place among people with competing interests, and the process frequently does not reflect an objective cost–benefit analysis. Tolling permits revenues to be collected at the point of road consumption and directed to those responsible for building and operating the road. Toll revenues can give investors strong incentives to pursue only investments with revenues that exceed their costs, so that they will not ignore projects with a large revenue-to-cost ratio and will not spend money on projects that do not have a positive return (see Box 9-2). However, private infrastructure investments may not give weight to public benefits of an investment that are not reflected in the project's revenues, such as increased safety or reduced pollution. For projects for which such benefits are substantial, it is important to have a public partner that can contribute funding that reflects the public benefits of the project.

To encourage development of more efficient forms of highway finance, the Department of Transportation has entered into Urban Partnership Agreements with several metropolitan areas that will undertake programs that include congestion pricing or variable toll demonstration projects. Calling for broader reform to highway finance, the Secretary of Transportation proposed a plan in 2008 to reform Federal highway policy by initiating a movement away from the fuel-tax-based approach to funding highway investment to methods that link fees more closely to use of the road system, such as congestion pricing. The Secretary also proposed expanding support for private sector participation in road projects, including removing current Federal statutory and regulatory barriers to tolling on Federally supported highways.

Box 9-2: The Role of Incentives in Road Investments

When private sector road operators rely on user fees for their revenue, the potential for profit gives them incentives to invest in projects that improve service to the public. Examples of such investment can be seen on the Indiana Toll Road, which provides a key route between Chicago and Ohio. In 2006, the State agreed to turn over operations on the road to the Indiana Toll Road Concession Company under a 75-year lease. Within the first year, the company installed electronic tolling facilities, easing congestion and saving commuters valuable time. The company also spent $250 million to add lanes to highly trafficked areas of the road. Because the company's profits depend on the toll revenues it generates, the operators have an incentive to improve road conditions when the cost of doing so is less than the extra revenue it gains from improving service to drivers.

While some State and local governments use cost–benefit analyses to guide their infrastructure investment decisions, many others fail to make the investments that offer the greatest net benefits. Traffic signal optimization is one area in which municipal governments have frequently failed to invest resources despite very high expected returns. Over time, pedestrian and vehicle traffic patterns change substantially as cities grow and residential and commercial areas develop. Retiming traffic signals to optimize traffic flow can reduce vehicle stops, which in turn reduces delays, fuel use, and vehicle emissions. Transportation engineers recommend retiming signals every 3 to 5 years, but a recent survey showed that only 60 percent of State and local traffic agencies retime their signals at least every 5 years.

Signal optimization is relatively inexpensive, and recent projects have seen benefits in time and fuel savings exceed their cost by more than 40 to 1. Cities like Nashville, Austin, and Portland, Oregon, have invested in signal optimization plans and seen improvements in traffic delay and air quality, but State and local agencies often fail to allocate resources to signal optimization programs. Many retime their signals infrequently or conduct traffic assessments only in response to citizen complaints. Local governments will better serve drivers if they follow the private sector's lead and base their investment decisions more heavily on cost–benefit analysis.

Aviation

Like roads, airports and air traffic control services are often provided by the public sector. As with fees to finance roads, it would be economically efficient to set aviation fees where a competitive market would set them, at marginal cost. In fact, aviation fees bear little relationship to marginal costs. Airport landing fees are generally based on aircraft weight, and air traffic control operations are funded largely by a ticket tax of 7.5 percent on each airline ticket. Air traffic control operations are also funded by fuel taxes and additional fees.

This approach to financing means that fees do not reflect marginal costs in at least two important respects. The cost of air traffic control services depends on the number of planes, not on the size of those planes or the number of passengers each carries. Similarly, each flight at a congested airport contributes approximately the same amount to congestion, regardless of the plane's size. Because fees are roughly proportional to the size of each plane and the value of tickets sold, an airline that flies a single plane with 200 passengers might pay roughly the same fees as an airline that flies 10 planes with 20 passengers each. The second airline, however, generates approximately 10 times as much congestion and requires about 10 times as much air traffic controller time.

The result is that airlines do not take into account the external cost they impose when they schedule a flight using a crowded airport. Airlines schedule frequent flights with small aircraft rather than fewer flights with larger aircraft. Overcrowded airports mean delayed flights, and delays have been increasing in recent years, with congestion at the Nation's busiest airports a significant contributing factor. Delays were especially severe in New York City airports in the summer of 2007; for example, at John F. Kennedy International Airport (JFK), only 56 percent of flights arrived on time during the summer months.

One method the government can use to address overcrowding is to place caps on the number of flights permitted to land at an airport, in order to limit those flights to the capacity the airport can accept. When the Federal Aviation Administration (FAA) establishes a cap at an airport, each airline is assigned "slots" permitting its aircraft to land or take off at particular times. Delays are thereby reduced by excluding other airlines from the airport. In the past, slots have been assigned through a negotiated process, and this approach was used in 2008 at JFK and Newark Liberty International airports after severe delays in the summer of 2007.

A problem with this approach is that the government must decide whose planes can and cannot land at the airport. The need to obtain slots from the government acts as a barrier to new entry at the airport, so that passengers are

denied the benefits of competition. Even if the FAA makes wise decisions about which airlines should initially receive slots when a cap is imposed at an airport, this allocation will become inefficient over time. But the FAA will find it difficult to further reallocate the slots regardless of how inefficient a given distribution of slots becomes: given their scarcity, slots are very valuable, so an incumbent authorized to use the slot will go to great lengths to maintain its allocation.

Recognizing the inefficiency that results when the government decides which airlines have access to an airport, the Administration has sought to use market-based mechanisms to allocate scarce airport capacity. One approach is to allow airports to charge landing fees in a way that reflects the greater demand to operate at certain times of the day. The Department of Transportation published guidance in 2008 clarifying that airports have the authority to charge congestion-based prices that would help encourage planes to use the airport when it is less busy, as long as the total charges imposed do not exceed the eligible costs of operating the airport. Under such an approach, airlines—and ultimately passengers—would decide whether it was worth paying a premium to schedule a flight at the most popular time.

Another approach with a similar result is to auction slots so that each slot is used by the airline that values it most highly. As with congestion-based landing fees, an auction would drive up the price of slots at the busiest times, but it would be less expensive to schedule a flight when the airport is less crowded. Auctions would permit new entry by airlines if they believed they could serve consumers more efficiently. In New York City, the Administration issued rules that would implement this approach for a limited number of slots. Apart from efficiently allocating the slots within the cap, an auction would reveal the market value of the other slots held by the airlines. This could help encourage airlines to trade slots among themselves if they discover that particular slots would be worth more in the hands of a different airline.

Conclusion

Government can play an important role in addressing the market failures associated with natural monopoly, externalities, and imperfect information. However, it would be naive to assume that government can eliminate all inefficiency in a market. Government lacks the information and incentives that make competitive markets work efficiently. Before intervening in a market, policymakers should first examine whether the inefficiencies of government involvement are outweighed by the inefficiencies of an unregulated market.

Regulation will be most efficient if it takes advantage of market mechanisms where possible. The Administration has taken an approach to regulation that supports competitive markets and attempts to take advantage of private sector incentives rather than working against them. There are many opportunities to further improve the efficiency of regulations, and this chapter has laid out a number of areas where such improvements are possible.