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OF THE  
COUNCIL OF ECONOMIC ADVISERS

LETTER OF TRANSMITTAL

COUNCIL OF ECONOMIC ADVISERS  
Washington, D.C., February 11, 2010

MR. PRESIDENT:

The Council of Economic Advisers herewith submits its 2010 Annual Report in accordance of the Employment Act of 1946 as amended by the Full Employment and Balanced Growth Act of 1978.

Sincerely,



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## C H A P T E R 1

# TO RESCUE, REBALANCE, AND REBUILD

President Obama took office at a time of economic crisis. The recession that began in December 2007 had accelerated following the financial crisis in September 2008. By January 2009, 11.9 million people were unemployed and real gross domestic product (GDP) was falling at a breakneck pace. The possibility of a second Great Depression was frighteningly real.

In the first months of the Administration, the President and Congress took unprecedented actions to restore demand, stabilize financial markets, and put people back to work. Just 28 days after his inauguration, the President signed the American Recovery and Reinvestment Act of 2009, the boldest countercyclical fiscal stimulus in American history. The Financial Stability Plan, announced in February, included wide-ranging measures to strengthen the banking system, increase consumer and business lending, and stem foreclosures and support the housing market. These and a host of other actions stabilized the financial system, supported those most directly affected by the recession, and walked the economy back from the brink.

But the Administration always knew that stabilizing the economy would not be enough. The problems that led to the crisis were years in the making. Continued action will be necessary to return the economy to full employment. In the process, an important rebalancing will need to occur. For too many years, America's growth and prosperity were fed by a boom in consumer spending stemming from rising asset prices and easy credit. The Federal Government had likewise been living beyond its means, resulting in large and growing budget deficits. And our regulatory system had failed to keep up with financial innovation, allowing risky practices to endanger the system and the economy. For this reason, the Administration has sought to help restore the economy to health on a foundation of greater investment, fiscal responsibility, and a well-functioning and secure financial system.

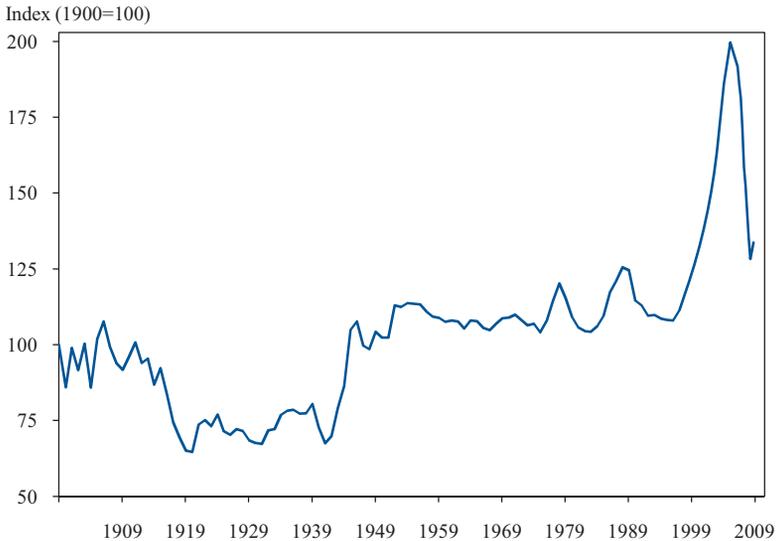
Even this important rebalancing would not be sufficient. In addition to the problems that had set the stage for the crisis, long-term challenges had been ignored and the U.S. economy was failing at some of its central tasks. Our health care system was beset by steadily rising costs, and millions of Americans either had no health insurance at all or were unsure whether their coverage would be there when they needed it. Middle-class families had seen their real incomes stagnate during the previous eight years, while those at the top of the income distribution had seen their incomes soar. A failure to slow the consumption of fossil fuels had contributed to global warming and continued dependence on foreign oil. And a country built on its record of innovation was failing to invest enough in research and development.

The President has dedicated his Administration to dealing with these long-run problems as well. As the new decade opens, Congress has come closer than ever before to passing landmark legislation reforming the health insurance system. This legislation would make health insurance more secure for those who have it and affordable for those who do not, and it would slow the growth rate of health care costs. Over the past year, the Administration has also worked with Congress to make important new investments to sustain and improve K-12 education and community colleges, jump-start the transition to a clean energy economy, and spur innovation through increased research and development. These and numerous other initiatives will help to rebuild the American economy stronger than before and put us on the path to sustained growth and prosperity. Enacting these policies will help to ensure that our children and grandchildren inherit a country as full of promise and as economically secure as ever in our history.

## **RESCUING AN ECONOMY IN FREEFALL**

In December 2007, the American economy entered what at first seemed likely to be a mild recession. As Figure 1-1 shows, real house prices (that is, house prices adjusted for inflation) had risen to unprecedented levels, almost doubling between 1997 and 2006. The rapid run-up in prices was accompanied by a residential construction boom and the proliferation of complex mortgages and mortgage-related financial assets. The fall of national house prices starting in early 2007, and the associated declines in the values of mortgage-backed and other related assets, led to a slowdown in the growth of consumer spending, increases in mortgage defaults and home foreclosures, significant strains on financial institutions, and reduced credit availability.

Figure 1-1  
House Prices Adjusted for Inflation



Sources: Shiller (2005); recent data from <http://www.econ.yale.edu/~shiller/data/Fig2-1.xls>.

By early 2008, the economy was contracting. Employment fell by an average of 137,000 jobs per month over the first eight months of 2008. Real GDP rose only anemically from the third quarter of 2007 to the second quarter of 2008.

Then in September 2008, the character of the downturn worsened dramatically. The collapse of Lehman Brothers and the near-collapse of American International Group (AIG) led to a seizing up of financial markets and plummeting consumer and business confidence. Parts of the financial system froze, and assets once assumed to be completely safe, such as money-market mutual funds, became unstable and subject to runs. Credit spreads, a common indicator of credit market stress, spiked to unprecedented levels in the fall of 2008. The value of the stock market plunged 24 percent in September and October, and another 15 percent by the end of January. As Figure 1-2 shows, over the final four months of 2008 and the first month of 2009, the economy lost, on average, a staggering 544,000 jobs per month, the highest level of job loss since the demobilization at the end of World War II. Real GDP fell at an increasingly rapid pace: an annual rate of 2.7 percent in the third quarter of 2008, 5.4 percent in the fourth quarter of 2008, and 6.4 percent in the first quarter of 2009.



remain in achieving a full recovery. It discusses some possible additional measures to spur private sector job creation.

### *Crisis and Recovery in the World Economy*

In the early fall of 2008, there was hope that the impact of the crisis on the rest of the world would be limited. Those hopes were dashed during the months that followed. In the fourth quarter of 2008 and the first quarter of 2009, real GDP fell sharply—often at double-digit rates—in the United Kingdom, Germany, Japan, Taiwan, and elsewhere. The surprisingly rapid spread of the downturn to the rest of the world reduced the demand for U.S. exports sharply, and so magnified our economic contraction.

The worldwide crisis required a worldwide response. Chapter 3 describes both the actions taken by individual countries and those taken through international institutions and cooperation. As described in the leaders' statement from the September summit of the Group of Twenty (G-20) nations, the result was “the largest and most coordinated fiscal and monetary stimulus ever undertaken” (Group of Twenty 2009). Just as the actions in the United States have begun to turn the domestic economy around, these international actions appear to have put the worst of the global crisis behind us. But the firmness of the budding recovery varies considerably across countries, and significant challenges still remain.

## **REBALANCING THE ECONOMY ON THE PATH TO FULL EMPLOYMENT**

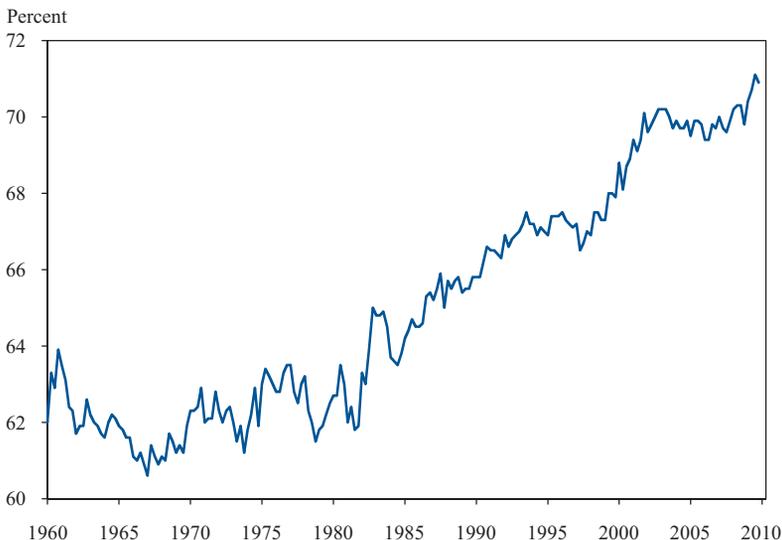
The path from budding recovery to full employment will surely be a difficult one. The problems that sowed the seeds of the financial crisis need to be dealt with so that the economy emerges from the recession with a stronger, more durable prosperity. There needs to be a rebalancing of the economy away from low personal saving and large government budget deficits and toward investment. Our financial system must be strengthened both to provide the lending needed to support the recovery and to reduce the risk of future crises.

### *Saving and Investment*

The expansion of the 2000s was fueled in part by high consumption. As Figure 1-3 shows, the share of GDP that takes the form of consumption has been on a generally upward trend for decades and reached unprecedented heights in the 2000s. The personal saving rate fell to exceptionally low levels, and trade deficits were large and persistent. A substantial amount

of the remainder of GDP took the form of housing construction, which may have crowded out other kinds of investment. Such an expansion is not just unstable, as we have learned painfully over the past two years. It also contributes too little to increases in standards of living. Low investment in equipment and factories slows the growth of productivity and wages.

Figure 1-3  
Personal Consumption Expenditures as a Share of GDP



Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.10.

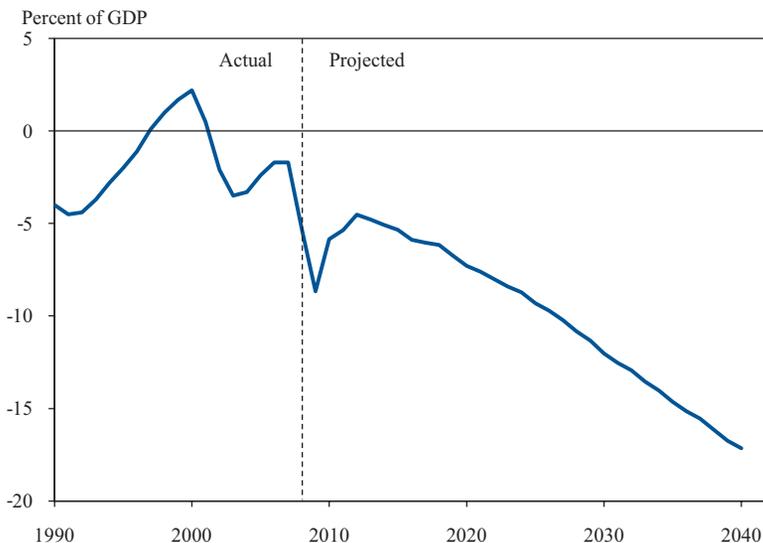
Chapter 4 examines the transition from consumption-driven growth to a greater emphasis on investment and exports. It discusses the likelihood that consumers will return to saving rates closer to the postwar average than to the very low rates of the early 2000s. It also describes the Administration's initiatives to encourage household saving. Greater personal saving will tend to encourage investment by helping to maintain low real interest rates. The increased investment will help to fill some of the gap in demand left by reduced consumption. Chapter 4 discusses additional Administration policies, such as investment tax incentives, designed to promote private investment. Higher saving relative to investment will reduce net international capital flows to the United States. Because net foreign borrowing must equal the current account deficit, lower net capital inflows imply a closer balance of exports and imports, which will help create further demand for American products. The Administration also supports aggressive export promotion measures to further increase demand for our exports. The end

result of this rebalancing will be an economy that is more stable, more investment-oriented, and more export-oriented, and thus better for our future standards of living.

### *Addressing the Long-Run Fiscal Challenge*

A key part of the rebalancing that must occur as the economy returns to full employment and beyond involves taming the Federal budget deficit. Figure 1-4 shows the actual and projected path of the budget surplus based on estimates released by the Congressional Budget Office (CBO) in January 2009, just before President Obama took office. As the figure makes clear, the budget surpluses of the late 1990s turned to substantial deficits in the 2000s, and the deficits were projected to grow even more sharply over the next three decades. As discussed in Chapter 5, the change to deficits in the 2000s largely reflects policy actions that were not paid for, such as the 2001 and 2003 tax cuts and the introduction of the Medicare prescription drug benefit. The projection of steadily increasing future deficits is largely due to the continuation of the decades-long trend of rising health care costs.

Figure 1-4  
Actual and Projected Budget Surpluses in January 2009 under Previous Policy



Note: CBO baseline surplus projection adjusted for CBO's estimates of costs of continued war spending, continuation of the 2001 and 2003 tax cuts, preventing scheduled cuts in Medicare's physician payment rates, and holding other discretionary outlays constant as a share of GDP.

Sources: Congressional Budget Office (2009a, 2009b).

Chapter 5 describes the likely consequences of these projected deficits over time and the importance of restoring fiscal discipline. It also discusses the President's plan for facing this challenge. A period of severe economic weakness is no time for a large fiscal contraction. Instead, the Nation must tackle the long-run deficit problem through actions that address the underlying sources of the problem over time. The single most important step that can be taken to reduce future deficits is to adopt health care reform that slows the growth rate of costs without compromising the quality of care. In addition, the President's fiscal 2011 budget includes other significant measures, such as allowing President Bush's tax cuts for the highest-income earners to expire, reforming international tax rules to discourage tax avoidance and encourage investment in the United States, and imposing a three-year freeze in nonsecurity discretionary spending; alongside a proposal for a bipartisan commission process to address the long-run gap between revenues and expenditures.

### *Building a Safer Financial System*

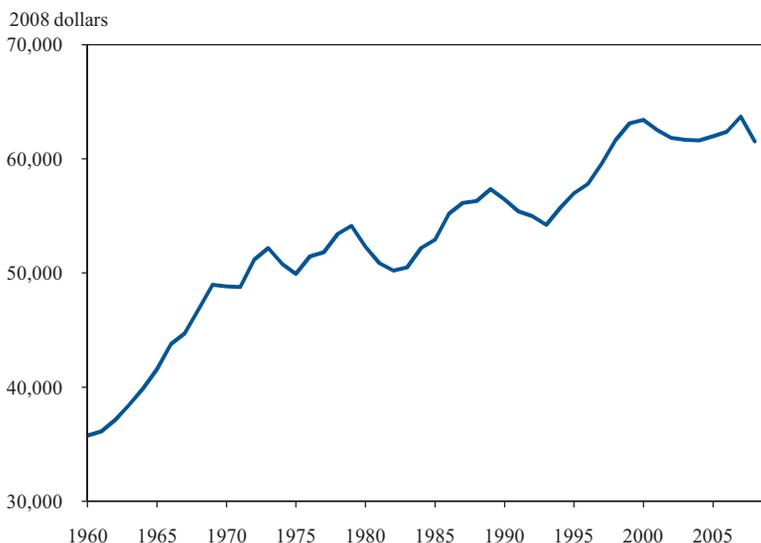
Risky credit practices both encouraged some of the imprudent rise in consumption and homebuilding in the previous decade and set the stage for the financial crisis. Chapter 6 analyzes the role that financial intermediaries play in the economy and diagnoses what went wrong during the meltdown of financial markets. The crisis showed that the Nation's financial regulatory structure, much of which had not been fundamentally changed since the 1930s, failed to keep up with the evolution of financial markets. The current system provided too little protection for the economy from actions that could threaten financial stability and too little protection for ordinary Americans in their dealings with sophisticated and powerful financial institutions and other providers of credit. Strengthening our financial system is thus a key element of the rebalancing needed to assure stable, robust growth.

Chapter 6 discusses financial regulatory modernization. What is needed is a system where capital requirements and sensible rules are set in a way to control excessive risk-taking; where regulators can consider risks to the system as a whole and not just to individual institutions; where institutions cannot choose their regulators; where regulators no longer face the unacceptable choice between the disorganized, catastrophic failure of a financial institution and a taxpayer-funded bailout; and where a dedicated agency has consumer protection as its central mandate. For this reason, the President put forward a comprehensive plan for financial regulatory reform last June and is working with Congress to ensure passage of these critical reforms this year.

## REBUILDING A STRONGER ECONOMY

Even before the crisis, the economy faced significant long-term challenges. As a result, it was doing poorly at providing rising standards of living for the vast majority of Americans. Figure 1-5 shows the evolution of before-tax real median family income since 1960. Beginning around 1970, slower productivity growth and rising income inequality caused incomes for most families to grow only slowly. After a half-decade of higher growth in the 1990s, the real income of the typical American family actually fell between 2000 and 2006.

Figure 1-5  
Real Median Family Income



Notes: Income measure is total money income excluding capital gains and before taxes. Annual income deflated using CPI-U-RS.  
Source: Department of Commerce (Census Bureau), Current Population Survey, Annual Social and Economic Supplement, Historical Income Table F-12.

A central focus of Administration policy both over the past year and for the years to come is to build a firmer foundation for the economy. The President is committed to policies that will raise living standards for all Americans.

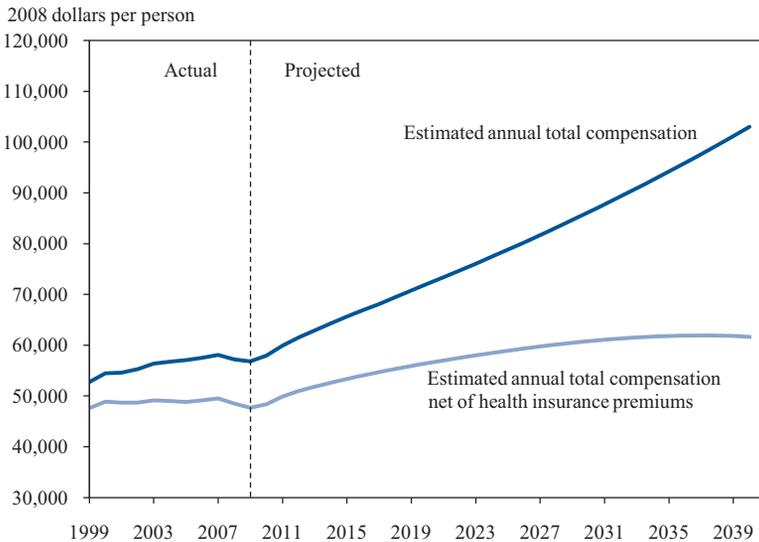
### *Reforming Health Care*

Health care is a key challenge that long predates the current economic crisis. The existing system has left many Americans who have health insurance inadequately covered, poorly protected against insurance industry

abuses, and fearful of losing the insurance they have. And it has left tens of millions of Americans with no insurance coverage at all. The system also delivers too little benefit at too high a cost. Comparisons across countries and, especially, across regions of the United States reveal large differences in health care spending that are not associated with differences in health outcomes and that cannot be fully explained by factors such as differences in demographics, health status, income, or medical care prices. These large differences in spending suggest that up to nearly 30 percent of health care spending could be saved without adverse health consequences. The unnecessary growth of health care costs is eroding the growth of take-home pay and is central to our long-run fiscal challenges. These adverse effects will only become more severe if cost growth is not slowed.

To illustrate what could happen to workers' earnings in the absence of reform, Figure 1-6 shows the historical and projected paths of real total compensation per worker (which includes nonwage benefits such as health insurance) and total compensation net of health insurance premiums. As health insurance premiums absorb a growing fraction of workers' compensation, the remaining portion of compensation levels off and then starts to decline.

Figure 1-6  
Total Compensation Including and Excluding Health Insurance



Note: Health insurance premiums include the employee- and employer-paid portions.  
Sources: Actual data from Department of Labor (Bureau of Labor Statistics); Kaiser Family Foundation and Health Research and Educational Trust (2009); Department of Health and Human Services (Agency for Healthcare Research and Quality, Center for Financing, Access, and Cost Trends), 2008 Medical Expenditure Panel Survey-Insurance Component. Projections based on CEA calculations.

Chapter 7 describes the actions the Administration and Congress took in 2009 to begin the process of improvement, including an expansion of the Children’s Health Insurance Program to provide access to health care for millions of children and important investments in the modernization of the health care system through the Recovery Act. It also describes the key elements of successful health insurance reform and discusses the progress that has been made on reform legislation. Successful reform involves making insurance more secure for those who have it and expanding coverage to those who lack it. It must include delivery system reforms, reductions in waste and improper payments in the Medicare system, and changes in consumer and firm incentives that will slow the growth rate of costs substantially, while maintaining and even improving quality. Slowing the growth rate of health care costs will have benefits throughout the economy: it will raise standards of living for families, help reduce the Federal budget deficit relative to what it otherwise would be, benefit state and local governments, and encourage job growth and improved macroeconomic performance.

### ***Strengthening the American Labor Force***

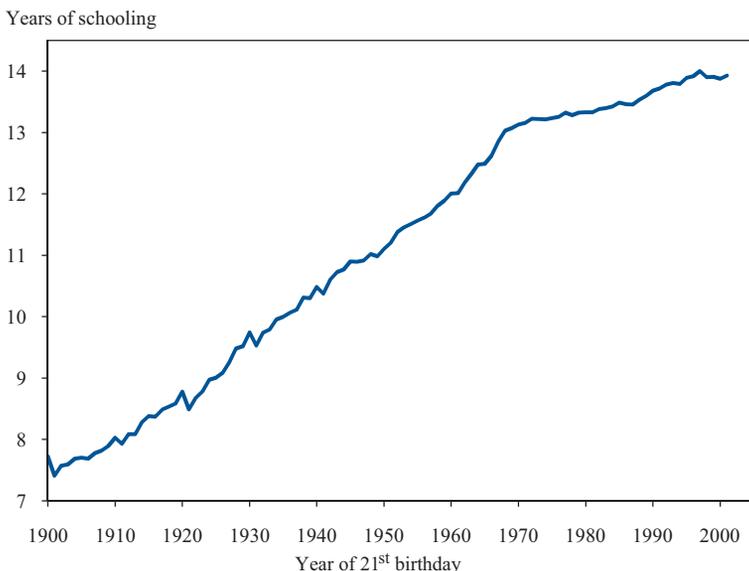
American workers have suffered greatly in the current recession. As described in Chapter 8, long-term unemployment is at record levels. The unemployment rate, which was 10 percent for the country as a whole in December, is far higher for blacks, Hispanics, and other demographic groups. The decline in house prices has eroded the nest eggs that many Americans had been counting on for their retirement. The Administration has initiated many actions to help support workers and their families through the recession and beyond. These actions range from extended and expanded unemployment insurance, to measures to make health insurance more affordable, to initiatives to promote retirement saving.

American workers also face the persistent problem of stagnating incomes. A key determinant of growth in standards of living is the rate of increase in the education and skills of our workforce. More and more jobs require education and training beyond the high school level, along with the ability to complete tasks that are open-ended and interactive. But, as Figure 1-7 shows, the years of education U.S. workers have brought to the labor market have risen little in the past four decades. And, as is well known, U.S. students lag behind those from many other countries in their performance on standardized tests.

Chapter 8 describes the Administration’s initiatives to improve the skills of our workers. The Administration is pursuing reform to eliminate wasteful subsidies to student loan providers, the savings from which will fund

new investments in education. The Administration has proposed a major initiative to support and improve community colleges, which are a neglected but critical link in our education system. It has also proposed increasing Pell Grants, and is taking steps to simplify the student aid application process so that eligible students are no longer discouraged by a complicated process from even applying for aid. All of these actions will help to achieve one of the President’s key educational goals for the country—that the proportion of adults with a college degree be the largest in the world by 2020.

Figure 1-7  
Mean Years of Schooling by Birth Cohort



Notes: Years of schooling at 30 years of age. Methodology described in Goldin and Katz (2007).  
Sources: Department of Commerce (Bureau of the Census), 1940-2000 Census IPUMS, 2005 CPS MORG; Goldin and Katz (2007).

### *Transforming the Energy Sector and Addressing Climate Change*

Climate change and energy independence present a very different long-run challenge. Continued reliance on fossil fuels is leading to the buildup of greenhouse gases in the atmosphere and is changing our climate. Left unaddressed, these trends will have increasingly severe consequences over time. What is more, the United States imports the majority of the oil it uses, much of it from sources that are potentially subject to disruption.

Chapter 9 analyzes how economic policy can play a critical role in moving the United States toward a clean energy economy that is less dependent on fossil fuels and fossil fuel imports. Slowing climate change requires

slowing the emission of greenhouse gases. A market-based approach, such as that supported by the Administration and currently working its way through Congress, can provide the signals needed to accomplish this slowing of emissions efficiently and with minimal disruptions.

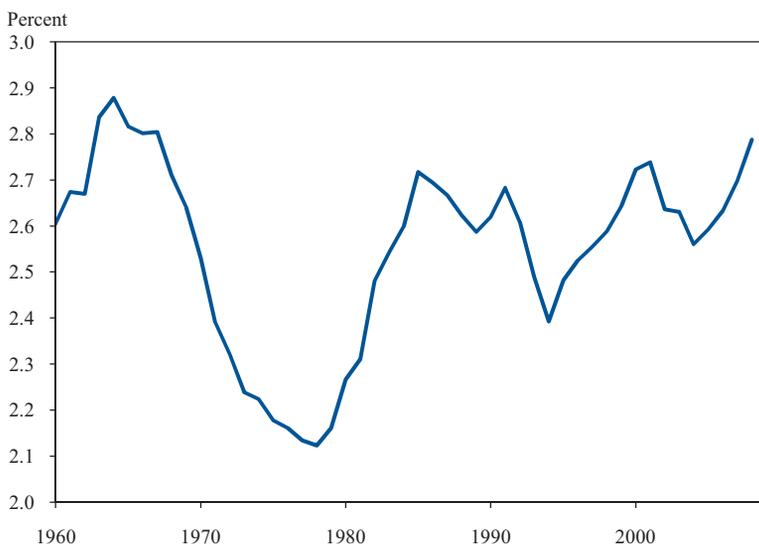
The support for research and development (R&D) and incentives for investment in clean energy technologies and energy efficiency in the Recovery Act and the President’s budget, as well as in the energy and climate legislation, can help foster the transition to a clean energy economy and spur growth in vital new industries. These new industries have the potential to reinvigorate the American manufacturing sector and generate secure, high-quality jobs.

### ***Fostering Productivity Growth Through Innovation and Trade***

The ultimate driver of growth in average standards of living is productivity growth. Increased investment in capital and in the skills of our workforce are two important sources of that growth. Chapter 10 examines two other sources of productivity gains: innovation and international trade.

Innovation comes from many sources. But a central one is investment in R&D. Figure 1-8 shows the share of GDP devoted to R&D over the past 50 years. In the mid-1960s, R&D constituted a larger share of total spending

Figure 1-8  
R&D Spending as a Percent of GDP



Note: Data for 2008 are preliminary.  
Sources: National Science Foundation, Science and Engineering Indicators 2010 Tables 4-1 and 4-7.

than it has in the past decade. And in some other countries, such as Korea, Sweden, and Japan, R&D spending is a larger fraction of GDP than in the United States. The President is committed to raising the share of output devoted to R&D to 3 percent, so that America can continue to be a leader in new technologies and American workers and businesses can benefit from more rapid economic growth.

Through the Recovery Act and other measures, the Administration is investing both directly in basic scientific research and development and in the infrastructure to support that research. Most innovation, however, comes from the private sector. Here, the Administration is providing critical incentives for R&D both in general and in such vital areas as clean energy technologies. The Administration is also pursuing a wide range of policies to support the small businesses that contribute so much to technological progress—policies ranging from programs to maintain the flow of credit to small businesses to health insurance reform that will help level the playing field between small and large businesses.

Finally, international trade can be an important source of productivity growth and incentives for innovation. Trade has the potential to allow the U.S. economy to expand output in areas where it is more productive and to enable higher-productivity firms to expand. Access to a world market encourages American firms to invest in the research needed to become technological leaders. Through these routes, a free and fair trade regime can play an important part in lifting living standards in the long run. But for trade to play this role, it is essential to enforce existing trade rules and pursue policies that ensure that the benefits of trade are widely shared.

## CONCLUSION

The past year has been one of great challenge for all Americans. Nearly every family has been touched in some way by the fallout from the crisis in financial markets, the drying up of credit, and the rise in unemployment. These challenges, moreover, have come after a decade in which ordinary Americans have seen their living standards stagnate, their health insurance become less secure, and their environment deteriorate.

The rest of this *Report* describes in more detail the actions the President has taken to end the recession, foster stable growth by rebalancing production and demand, and rebuild the foundation of the American economy. More fundamentally, it describes the work that remains to be done to create the prosperous, dynamic economy the American people need and deserve.



## C H A P T E R 2

# RESCUING THE ECONOMY FROM THE GREAT RECESSION

**T**he first and most fundamental task the Administration faced when President Obama took office was to rescue an economy in freefall. In November 2008, employment was declining at a rate of more than half a million jobs per month, and credit markets were stretched almost to the breaking point. As the economy entered 2009, the decline accelerated, with job loss in January reaching almost three-quarters of a million. The President responded by working with Congress to take unprecedented actions. These steps, together with measures taken by the Federal Reserve and other financial regulators, have succeeded in stabilizing the economy and beginning the process of healing a severely shaken economic and financial system. But much work remains. With high unemployment and continued job losses, it is clear that recovery must remain the key focus of 2010.

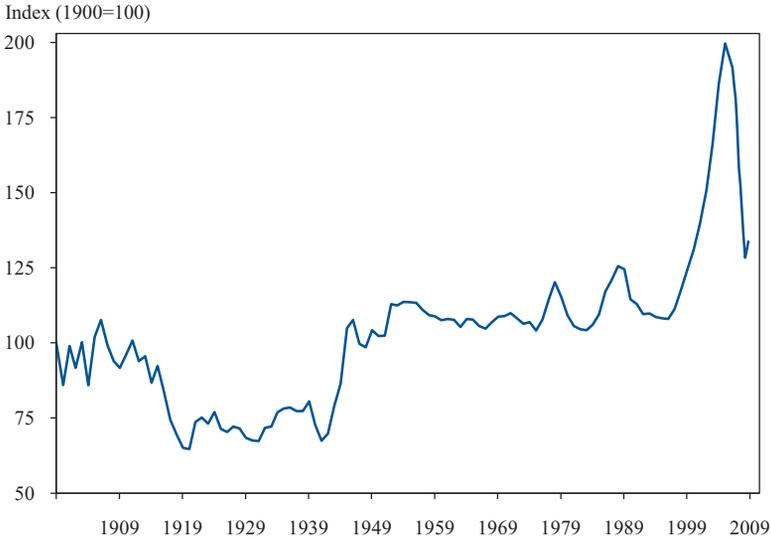
### **AN ECONOMY IN FREEFALL**

According to the National Bureau of Economic Research, the United States entered a recession in December 2007. Unlike most postwar recessions, this downturn was not caused by tight monetary policy aimed at curbing inflation. Although economists will surely analyze this downturn extensively in the years to come, there is widespread consensus that its central precipitating factor was a boom and bust in asset prices, especially house prices. The boom was fueled in part by irresponsible and in some cases predatory lending practices, risky investment strategies, faulty credit ratings, and lax regulation. When the boom ended, the result was widespread defaults and crippling blows to key financial institutions, magnifying the decline in house prices and causing enormous spillovers to the remainder of the economy.

## *The Run-Up to the Recession*

The rise in house prices during the boom was remarkable. As Figure 2-1 shows, real house prices almost doubled between 1997 and 2006. By 2006, they were more than 50 percent above the highest level they had reached in the 20th century.

Figure 2-1  
House Prices Adjusted for Inflation



Sources: Shiller (2005); recent data from <http://www.econ.yale.edu/~shiller/data/fig2-1.xls>.

Stock prices also rose rapidly. The Standard and Poor's (S&P) 500, for example, rose 101 percent between its low in 2002 and its high in 2007. That rise, though dramatic, was not unprecedented. Indeed, in the five years before its peak in March 2000, during the "tech bubble," the S&P 500 rose 205 percent, while the more technology-focused NASDAQ index rose 506 percent.

The run-up in asset prices was associated with a surge in construction and consumer spending. Residential construction rose sharply as developers responded to the increase in housing demand. From the fourth quarter of 2001 to the fourth quarter of 2005, the residential investment component of real GDP rose at an average annual rate of nearly 8 percent. Similarly, consumers responded to the increases in the value of their assets by continuing to spend freely. Saving rates, which had been declining since the early 1980s, fell to about 2 percent during the two years before the recession. This spending was facilitated by low interest rates and easy credit, with household borrowing rising faster than incomes.

## *The Downturn*

House prices began to drop in some markets in 2006, and then nationally beginning in 2007. This process was gradual at first, with prices measured using the LoanPerformance house price index declining just 3½ percent nationally between January and June 2007. Lenders had lent aggressively during the boom, often providing mortgages whose soundness hinged on continued house price appreciation. As a result, the comparatively modest decline in house prices threatened large losses on subprime residential mortgages (the riskiest class of mortgages), as well as on the slightly higher-quality “Alt-A” mortgages. As the availability of mortgage credit tightened, the downward pressure on real estate prices intensified. National house prices declined 6 percent between June and December 2007.

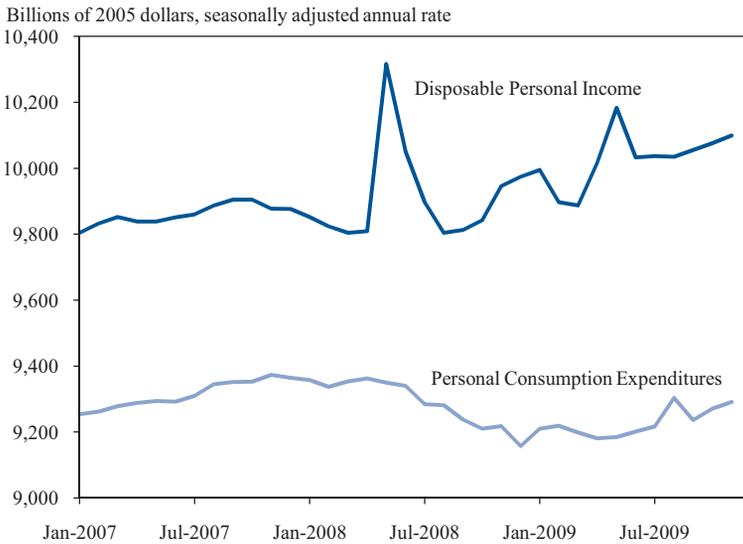
The negative feedback between credit availability and the housing market weighed on household and business confidence, restraining consumer spending and business investment. Although residential construction led the slowdown in real activity through 2007, by early 2008 outlays for consumer goods and services and business equipment and software had decelerated sharply, and total employment was beginning to decline. Real gross domestic product (GDP) fell slightly in the first quarter of 2008.

In February 2008, Congress passed a temporary tax cut. Figure 2-2 shows real after-tax (or disposable) income and consumer spending before and after rebate checks were issued. Consumption was maintained despite a tremendous decline in household wealth over the same period. Total household and nonprofit net worth declined 9.1 percent between June 2007 and June 2008. Microeconomic studies of consumer behavior in this episode confirm the role of the tax rebate in maintaining spending (Broda and Parker 2008; Sahm, Shapiro, and Slemrod 2009). The fact that real GDP reversed course and grew in the second quarter of 2008 is further tribute to the helpfulness of the policy. But, in part because of the lack of robust, sustained stimulus, growth did not continue.

Financial institutions had invested heavily in assets whose values were tied to the value of mortgages. For many reasons—the opacity of the instruments, the complexity of financial institutions’ balance sheets and their “off-balance-sheet” exposures, the failure of credit-rating agencies to accurately identify the riskiness of the assets, and poor regulatory oversight—the extent of the institutions’ exposure to mortgage default risk was obscured. When mortgage defaults rose, the result was unexpectedly large losses to many financial institutions.

In the fall of 2008, the nature of the downturn changed dramatically. More rapid declines in asset prices generated further loss of confidence in the ability of some of the world’s largest financial institutions to honor

Figure 2-2  
Income and Consumption Around the 2008 Tax Rebate



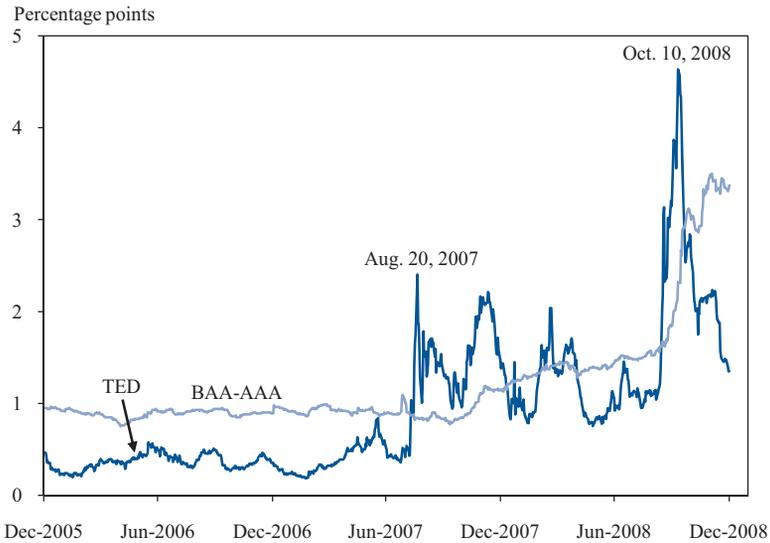
Sources: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 2.6, line 30, and Table 2.8.6, line 1.

their obligations. In September, the Lehman Brothers investment bank declared bankruptcy, and other large financial firms (including American International Group, Washington Mutual, and Merrill Lynch) were forced to seek government aid or to merge with stronger institutions. What followed was a rush to liquidity and a cascading of retrenchment that had many of the features of a classic financial panic.

Risk spreads shot up to extraordinary levels. Figure 2-3 shows both the TED spread and Moody's BAA-AAA spread. The TED spread is the difference between the rate on short-term loans among banks and a safe short-term Treasury interest rate. The BAA-AAA spread is the difference between the interest rates on high-grade and medium-grade corporate bonds. Both spreads rose dramatically during the heart of the panic. Indeed, one way to put the spike in the BAA-AAA spread in perspective is to note that the same spread barely moved during the Great Crash of the stock market in 1929, and rose by only about half as much during the first wave of banking panics in 1930 as it did in the fall of 2008.

The same loss of confidence shown by the rise in credit spreads translated into declining asset prices of all sorts. The S&P 500 declined 29 percent in the second half of 2008. Real house prices tumbled another 11 percent over the same period (see Figure 2-1). All told, household and

Figure 2-3  
TED Spread and Moody's BAA-AAA Spread Through December 2008



Notes: The TED spread is defined as the three-month London Interbank Offered Rate (Libor) less the yield on the three-month U.S. Treasury security. Moody's BAA-AAA spread is the difference between Moody's indexes of yields on AAA and BAA rated corporate bonds.

Source: Bloomberg.

nonprofit net worth declined 20 percent between December 2007 and December 2008, or by about \$13 trillion. Again, a useful way to calibrate the size of this shock is to note that in 1929, household wealth declined only 3 percent—about one-seventh as much as in 2008. This is another indication that the shocks hitting the U.S. economy in 2008 were enormous.

The decline in wealth had a severe impact on consumer spending. This key component of aggregate demand, which accounts for roughly 70 percent of GDP and is traditionally quite stable, declined at an annual rate of 3.5 percent in the third quarter of 2008 and 3.1 percent in the fourth quarter. Some of this large decline may have also reflected the surge in uncertainty about future incomes. Not only did asset prices fall sharply, leading to the decline in wealth; they also became dramatically more volatile. The standard deviation of daily stock returns in the fourth quarter, for example, was 4.3 percentage points, even larger than in the first months of the Great Depression.

The financial panic led to a precipitous decline in lending. Bank credit continued to rise over the latter portion of 2008, as households and firms that had lost access to other forms of credit turned to banks. However, bank loans declined sharply in the first and second quarters of 2009 as banks tightened their terms and standards. Other sources of credit showed even

more substantial declines. One particularly important market is that for commercial paper (short-term notes issued by firms to finance key operating costs such as payroll and inventory). The market for lower-tier nonfinancial (A2/P2) commercial paper collapsed in the fall of 2008, with the average daily value of new issues falling from \$8.0 billion in the second quarter of 2008 to \$4.3 billion in the fourth quarter. In addition, securitization of automobile loans, credit card receivables, student loans, and commercial mortgages ground to a halt.

This freezing of credit markets, together with the decline in wealth and confidence, caused consumer spending and residential investment to fall sharply. Real GDP declined at an annual rate of 2.7 percent in the third quarter of 2008, 5.4 percent in the fourth quarter, and 6.4 percent in the first quarter of 2009. Industrial production, which had been falling steadily over the first eight months of 2008, plummeted in the final four months—dropping at an annual rate of 18 percent.

Many industries were battered by the financial crisis and the resulting economic downturn. The American automobile industry was hit particularly hard. Sales of light motor vehicles, which had exceeded 16 million units every year from 1999 to 2007, fell to an annual rate of only 9.5 million in the first quarter of 2009. Employment in the motor vehicle and parts industry declined by 240,000 over the 12 months through January 2009. Two domestic manufacturers, General Motors (GM) and Chrysler, required emergency loans in late December 2008 and early January 2009 to avoid disorderly bankruptcy.

The most disturbing manifestation of the rapid slowdown in the economy was the dramatic increase in job loss. Over the first months of 2008, job losses were typically between 100,000 and 200,000 per month. In October, the economy lost 380,000 jobs; in November, 597,000 jobs. By January, the economy was losing jobs at a rate of 741,000 per month. Commensurate with this terrible rate of job loss, the unemployment rate rose rapidly—from 6.2 percent in September 2008 to 7.7 percent in January 2009. It then continued to rise by roughly one-half of a percentage point per month through the winter and spring; it reached 9.4 percent in May, and ended the year at 10.0 percent.

### *Wall Street and Main Street*

As described in more detail later, policymakers have focused much of their response to the crisis on stabilizing the financial system. Many Americans are troubled by these policies. Because to a large extent it was the actions of credit market participants that led to the crisis, people ask why policymakers should take actions focused on restoring credit markets.

The basic reason for these policies is that the health of credit markets is critically important to the functioning of our economy. Large firms use commercial paper to finance their biweekly payrolls and pay suppliers for materials to keep production lines going. Small firms rely on bank loans to meet their payrolls and pay for supplies while they wait for payment of their accounts receivable. Home purchases depend on mortgages; automobile purchases depend on car loans; college educations depend on student loans; and purchases of everyday items depend on credit cards.

The events of the past two years provide a dramatic demonstration of the importance of credit in the modern economy. As the President said in his inaugural address, “Our workers are no less productive than when this crisis began. Our minds are no less inventive, our goods and services no less needed.” Yet developments in financial markets—rises and falls in home and equity prices and in the availability of credit—have led to a collapse of spending, and hence to a precipitous decline in output and to unemployment for millions.

Numerous academic studies before the crisis had also shown that the availability of credit is critical to investment, hiring, and production. One study, for example, found that when a parent company earns high profits and so has less need to rely on credit, the additional funds lead to higher investment by subsidiaries in completely unrelated lines of business (Lamont 1997). Another found that when a small change in a firm’s circumstances frees up a large amount of funds that would otherwise have to go to pension contributions, the result is a large change in spending on capital goods (Rauh 2006). Other studies have shown that when the Federal Reserve tightens monetary policy, small firms, which typically have more difficulty obtaining financing, are hit especially hard (Gertler and Gilchrist 1994), and firms without access to public debt markets cut their inventories much more sharply than firms that have such access (Kashyap, Lamont, and Stein 1994).

Research before the crisis had also found that financial market disruptions could affect the real economy. Ben Bernanke, who is now Chairman of the Federal Reserve, demonstrated a link between the disruption of lending caused by bank failures and the worsening of the Great Depression (Bernanke 1983). A smaller but more modern example is provided by the impact of Japan’s financial crisis in the 1990s on the United States: construction lending, new construction, and construction employment were more adversely affected in U.S. states where subsidiaries of Japanese banks had a larger role, and thus where credit availability was more affected by the collapse of Japan’s bubble (Peek and Rosengren 2000). That a financial disruption in a trading partner can have a detectable adverse impact on our economy through its impact on credit availability suggests that the effect of

a full-fledged financial crisis at home would be enormous—an implication that, sadly, has proven to be correct.

Finally, microeconomic evidence from the recent crisis also shows the importance of the financial system to the real economy. For example, firms that happened to have long-term debt coming due after the crisis began, and thus faced high costs of refinancing, cut their investment much more than firms that did not (Almeida et al. 2009). Another study found that a majority of corporate chief financial officers surveyed reported that their firms faced financing constraints during the crisis, and that the constrained firms on average planned to reduce investment spending, research and development, and employment sharply compared with the unconstrained firms (Campello, Graham, and Harvey 2009).

In short, the goal of the policies to stabilize the financial system was not to help financial institutions. The goal was to help ordinary Americans. When the financial system is not working, individuals and businesses cannot get credit, demand and production plummet, and job losses skyrocket. Thus, an essential step in healing the real economy is to heal the financial system. The alternative of letting financial institutions suffer the consequences of their mistakes would have led to a collapse of credit markets and vastly greater suffering for millions and millions of Americans.

The policies to rescue the financial sector were, however, costly, and often had the side effect of benefiting the very institutions whose irresponsible actions contributed to the crisis. That is one reason that the President has endorsed a Financial Crisis Responsibility Fee on the largest financial firms to repay the Federal Government for its extraordinary actions. As discussed in Chapter 6, the Administration has also proposed a comprehensive plan for financial regulatory reform that will help ensure that Wall Street does not return to the risky practices that were a central cause of the recent crisis.

## **THE UNPRECEDENTED POLICY RESPONSE**

Given the magnitude of the shocks that hit the economy in the fall of 2008 and the winter of 2009, the downturn could have turned into a second Great Depression. That it has not is a tribute to the aggressive and effective policy response. This response involved the Federal Reserve and other financial regulators, the Administration, and Congress. The policy tools were similarly multifaceted, including monetary policy, financial market interventions, fiscal policy, and policies targeted specifically at housing.

## *Monetary Policy*

The first line of defense against a weak economy is the interest rate policy of the independent Federal Reserve. By increasing or decreasing the quantity of reserves it supplies to the banking system, the Federal Reserve can lower or raise the Federal funds rate, which is the interest rate at which banks lend to one another. The funds rate influences other interest rates in the economy and so has important effects on economic activity. Using changes in the target level of the funds rate as their main tool of counter-cyclical policy, monetary policymakers had kept inflation low and the real economy remarkably stable for more than two decades.

The Federal Reserve has used interest rate policy aggressively in the recent episode. The target level of the funds rate at the beginning of 2007 was 5¼ percent. The Federal Reserve cut the target by 1 percentage point over the last four months of 2007 and by an additional 2¼ percentage points over the first four months of 2008. After the events of September, it cut the target in three additional steps in October and December, bringing it to its current level of 0 to ¼ percent.

Conventional interest rate policy, however, could do little to deal with the enormous disruptions to credit markets. As a result, the Federal Reserve has used a range of unconventional tools to address those disruptions directly. For example, in March 2008, it created the Primary Dealer Credit Facility and the Term Securities Lending Facility to provide liquidity support for primary dealers (that is, financial institutions that trade directly with the Federal Reserve) and the key financial markets in which they operate. In October 2008, when the critical market for commercial paper threatened to stop functioning, the Federal Reserve responded by setting up the Commercial Paper Funding Facility to backstop the market.

Once the Federal Reserve's target for the funds rate was effectively lowered to zero in December 2008, there was another reason to use unconventional tools. Nominal interest rates generally cannot fall below zero: because holding currency guarantees a nominal return of zero, no one is willing to make loans at a negative nominal interest rate. As a result, when the Federal funds rate is zero, supplying more reserves does not drive it lower. Statistical estimates suggest that based on the Federal Reserve's usual response to inflation and unemployment, the subdued level of inflation and the weak state of the economy would have led the central bank to reduce its target for the funds rate by about an additional 5 percentage points if it could have (Rudebusch 2009).

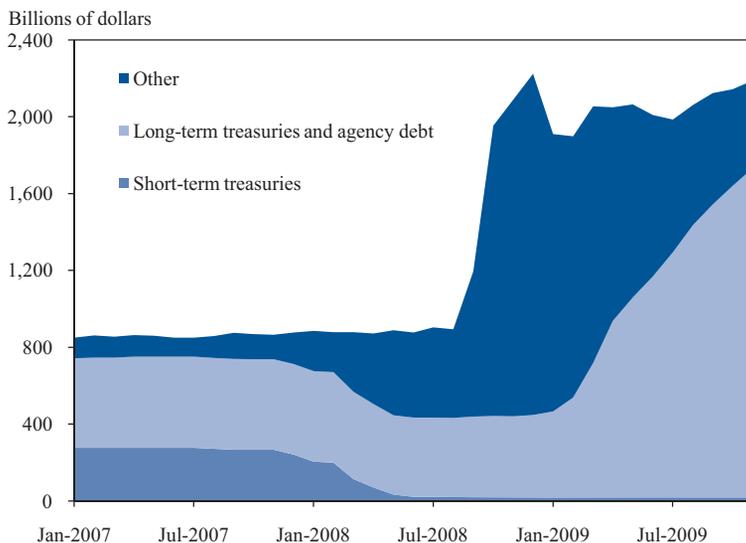
This desire to provide further stimulus, coupled with the inability to use conventional interest rate policy, led the Federal Reserve to undertake large-scale asset purchases to reduce long-term interest rates. In March

2009, the Federal Reserve announced plans to purchase up to \$300 billion of long-term Treasury debt; it also announced plans to increase its purchases of the debt of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks (the government-sponsored enterprises, or GSEs, that support the mortgage market) to up to \$200 billion, and its purchases of agency (that is, Fannie Mae, Freddie Mac, and Ginnie Mae) mortgage-backed securities to up to \$1.25 trillion.

Finally, the Federal Reserve has attempted to manage expectations by providing information about its goals and the likely path of policy. Officials have consistently stressed their commitment to ensuring that inflation neither falls substantially below nor rises substantially above its usual level. In addition, the Federal Reserve has repeatedly stated that economic conditions “are likely to warrant exceptionally low levels of the Federal funds rate for an extended period.” To the extent this statement provides market participants with information they did not already have, it is likely to keep longer-term interest rates lower than they otherwise would be.

One effect of the Federal Reserve’s unconventional policies has been an enormous expansion of the quantity of assets on the Federal Reserve’s balance sheet. Figure 2-4 shows the evolution of Federal Reserve asset holdings since the beginning of 2007. One can see both that asset holdings nearly tripled between January and December 2008 and that there was a dramatic move away from short-term Treasury securities.

Figure 2-4  
Assets on the Federal Reserve’s Balance Sheet



Notes: Agency debt refers to obligations of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks. Agency mortgage-backed securities are also included in this category.  
Source: Federal Reserve Board, H.4.1 Table 1.

The flip side of the large increase in the Federal Reserve's asset holdings is a large increase in the quantity of reserves it has supplied to the financial system. Some observers have expressed concern that the large expansion in reserves could lead to inflation. In this regard, two key points should be kept in mind. First, as already described, most statistical models suggest that the Federal Reserve's target interest rate would be substantially lower than it is today if it were not constrained by the fact that the Federal funds rate cannot fall below zero. As a result, monetary policy is in fact unusually tight given the state of the economy, not unusually loose. Second, the Federal Reserve has the tools it needs to prevent the reserves from leading to inflation. It can drain the reserves from the financial system through sales of the assets it has acquired or other actions. Indeed, despite the weak state of the economy, the return of credit market conditions toward normal is leading to the natural unwinding of some of the exceptional credit market programs. Another reliable way the Federal Reserve can keep the reserves from creating inflationary pressure is by using its relatively new ability to raise the interest rate it pays on reserves: banks will be unwilling to lend the reserves at low interest rates if they can obtain a higher return on their balances held at the Federal Reserve.

### *Financial Rescue*

Efforts to stabilize the financial system have been a central part of the policy response. As just discussed, even before the financial crisis in September 2008, the Federal Reserve was taking steps to ease pressures on credit markets. The events of the fall led to even stronger actions. On September 7, Fannie Mae and Freddie Mac were placed in conservatorship under the Federal Housing Finance Agency to prevent a potentially severe disruption of mortgage lending. On September 16, concern about the potentially catastrophic effects of a disorderly failure of American International Group (AIG) caused the Federal Reserve to extend the firm an \$85 billion line of credit. On September 19, concerns about the possibility of runs on money-market mutual funds led the Treasury to announce a temporary guarantee program for these funds.

On October 3, Congress passed and President Bush signed the Emergency Economic Stabilization Act of 2008. This Act provided up to \$700 billion for the Troubled Asset Relief Program (TARP) for the purchase of distressed assets and for capital injections into financial institutions, although the second \$350 billion required presidential notification to Congress and could be disallowed by a vote of both houses. The initial \$350 billion was used mainly to purchase preferred equity shares in financial institutions, thereby providing the institutions with more capital to help them withstand the crisis.

At President-Elect Obama's request, President Bush notified Congress on January 12, 2009 of his plan to release the second \$350 billion of TARP funds. With strong support from the incoming Administration, the Senate defeated a resolution disapproving the release. These funds provided policy-makers with critical resources needed to ensure financial stability.

On February 10, 2009, Secretary of the Treasury Timothy Geithner announced the Administration's Financial Stability Plan. The plan represented a new, comprehensive approach to the financial rescue that sought to tackle the interlocking sources of instability and increase credit flows. An overarching theme was a focus on transparency and accountability to rebuild confidence in financial markets and protect taxpayer resources.

A key element of the plan was the Supervisory Capital Assessment Program (or "stress test"). The purpose was to assess the capital needs of the country's 19 largest financial institutions should economic and financial conditions deteriorate further. Institutions that were found to need an additional capital buffer would be encouraged to raise private capital and would be provided with temporary government capital if those efforts did not succeed. This program was intended not just to examine the capital positions of the institutions and ensure that they obtained more capital if needed, but also to strengthen private investors' confidence in the soundness of the institutions' balance sheets, and so strengthen the institutions' ability to obtain private capital.

Another element of the plan was the Consumer and Business Lending Initiative, which was aimed at maintaining the flow of credit. In November 2008, the Federal Reserve had created the Term Asset-Backed Securities Loan Facility to help counteract the dramatic decline in securitized lending. In the February announcement of the Financial Stability Plan, the Treasury greatly expanded the resources of the not-yet-implemented facility. The Treasury increased its commitment to \$100 billion to leverage up to \$1 trillion of lending for businesses and households. By facilitating securitization, the program was designed to help unfreeze credit and lower interest rates for auto loans, credit card loans, student loans, and small business loans guaranteed by the Small Business Administration (SBA).

A third element of the plan was a Treasury partnership with the Federal Deposit Insurance Corporation and the Federal Reserve to create the Public-Private Investment Program. A central purpose was to remove troubled assets from the balance sheets of financial institutions, thereby reducing uncertainty about their financial strength and increasing their ability to raise capital and hence their willingness to lend. Partnership with the private sector served two important objectives: it leveraged scarce public funds, and it used private competition and incentives to ensure that the government did not overpay for assets.

There were two other key components of the Financial Stability Plan. One was a wide-ranging program to reduce mortgage interest rates and help responsible homeowners stay in their homes. These policies are described later in the section on housing policy. The other component was a range of measures to help small businesses. Many of these were included in the American Recovery and Reinvestment Act and are discussed in the section on fiscal stimulus.

Failure of the two troubled domestic automakers (GM and Chrysler) threatened economy-wide repercussions that would have been magnified by related problems at the automakers' associated financial institutions (GMAC and Chrysler Financial). To avoid these consequences, the Bush Administration set up the Auto Industry Financing Program within the TARP. This program extended \$17.4 billion in funding to the two companies in late December 2008 and early January 2009. The program also extended \$7.5 billion in funding to the two auto finance companies around the same time. Upon taking office, the Obama Administration required the automakers to submit plans for restructuring and a return to viability before additional funds were committed. To sustain the industry during this planning process, the Treasury established the Warranty Commitment Program to reassure consumers that warranties of the troubled firms would be honored. It also initiated the Auto Supplier Support Program to maintain stability in the auto supply base.

Over the spring of 2009, the Administration's Auto Task Force worked with GM and Chrysler to produce plans for viability. In the case of Chrysler, the task force determined that viability could be achieved by merging with the Italian automaker Fiat. For GM, the task force determined that substantial reductions in costs were necessary and charged the company with producing a more aggressive restructuring plan. For both companies, a quick, targeted bankruptcy was judged to be the most efficient and successful way to restructure. Chrysler filed for bankruptcy on April 30, 2009; GM, on June 1. In addition to concessions by all stakeholders, including workers, retirees, creditors, and suppliers, the U.S. Government invested substantial funds to bring about the orderly restructuring. In all, more than \$80 billion of TARP funds had been authorized for the motor vehicle industry as of September 20, 2009.

### ***Fiscal Stimulus***

The signature element of the Administration's policy response to the crisis was the American Recovery and Reinvestment Act of 2009 (ARRA). The President signed the Recovery Act in Denver on February 17, just 28 days after taking office. At an estimated cost of \$787 billion, the Act is

the largest countercyclical fiscal action in American history. It provides tax cuts and increases in government spending equivalent to roughly 2 percent of GDP in 2009 and 2¼ percent of GDP in 2010. To put those figures in perspective, the largest expansionary swing in the budget during Franklin Roosevelt's New Deal was an increase in the deficit of about 1½ percent of GDP in fiscal 1936. That expansion, however, was counteracted the very next fiscal year by a contraction that was even larger.

The fiscal stimulus was designed to fill part of the shortfall in aggregate demand caused by the collapse of private demand and the Federal Reserve's inability to lower short-term interest rates further. It was part of a comprehensive package that included stabilizing the financial system, helping responsible homeowners avoid foreclosure, and aiding small businesses through tax relief and increased lending. The President set as a goal for the fiscal stimulus that it raise employment by 3½ million relative to what it otherwise would have been.

Several principles guided the design of the stimulus. One was that it be spread over two years, reflecting the Administration's view that the economy would need substantial support for more than one year. At the same time, the Administration also strongly supported keeping the stimulus explicitly temporary. It was not to be an excuse to permanently expand the size of government.

A second key principle was that the stimulus be well diversified. Different types of stimulus affect the economy in different ways. Individual tax cuts, for example, affect production and employment in a wide range of industries by encouraging households to spend more on consumer goods, while government investments in infrastructure directly increase construction activity and employment. In addition, underlying economic conditions affect the efficacy of fiscal policy in ways that can be quantitatively important and sometimes difficult to forecast. Likewise, different types of stimulus affect the economy with different speeds. For instance, aid to individuals directly affected by the recession tends to be spent relatively quickly, while new investment projects require more time. Because of the need to provide broad support to the economy over an extended period, the Administration supported a stimulus plan that included a broad range of fiscal actions.

A third principle was that emergency spending should aim to address long-term needs. Some spending, such as unemployment insurance, is aimed at helping those directly affected by the recession maintain a decent standard of living. But government investment spending should aim to create enduring capital investments that increase productivity and growth.

The Recovery Act reflected those guiding principles. The Congressional Budget Office (CBO) estimated that almost one-quarter of the stimulus

would be spent by the end of the third quarter of 2009, and an additional half would be spent over the next four quarters (Congressional Budget Office 2009b). So far, the pace of the spending and tax cuts has largely matched CBO's estimates.

The final package was very well diversified. Roughly one-third took the form of tax cuts. The most significant of these was the Making Work Pay tax credit, which cut taxes for 95 percent of working families. Taxes for a typical family were reduced by \$800 per couple for each of 2009 and 2010. Another provision of the bill provided roughly \$14 billion for one-time payments of \$250 to seniors, veterans, and people with disabilities. The macroeconomic effects of these payments are likely to be similar to those of tax cuts.

Businesses received important tax cuts as well. The most important of these was an extension of bonus depreciation, which reduced taxes on new investments by allowing firms to immediately deduct half the cost of property and equipment purchases. One advantage of such temporary investment incentives is that they can affect the timing of investment, moving some investment from future years when the economy does not have a deficiency of aggregate demand to the present, when it does.

In addition, because the financial market disruptions had a particularly paralyzing effect on the financial plans of small businesses, the Act included additional measures targeted specifically at those businesses. Tax cuts for small businesses included an expansion of provisions allowing for the carryback of net operating losses, a temporary 75 percent exclusion from capital gains taxes on small business stock, and the ability to immediately expense up to \$250,000 of qualified investment purchases. In addition to reducing taxes, these provisions improve cash flow at firms facing credit constraints and provide extra incentives for individuals to invest in small businesses. The Act also included measures to help increase small business lending through the SBA. In particular, it raised to 90 percent the maximum guarantee on SBA general purpose and working capital loans (the 7(a) program) and eliminated fees on both 7(a) loans and loans for fixed-asset capital and real estate investment projects (the 504 program).

Another important part of the stimulus consisted of fiscal relief to state governments. Because almost every state has a balanced-budget requirement, the declines in revenues caused by the recession forced states to cut spending or raise taxes, thereby further contracting demand and magnifying the downturn. Federal fiscal relief can help prevent these contractionary responses, helping to maintain critical state services and state employment, prevent tax increases on families already suffering from the recession, and

cushion the fall in demand. And because many states were already raising taxes and cutting spending when the ARRA was passed, the effects were likely to occur relatively quickly. The Act therefore included roughly \$140 billion of state fiscal relief.

The Recovery Act also included approximately \$90 billion of support for individuals directly affected by the recession. This support serves two critical purposes. First, it provides relief from the recession's devastating impact on families and individuals. Second, because the recipients typically spend this support quickly, it provides an immediate boost to the broader economy. Among the major components of this relief were an extension and expansion of unemployment insurance benefits, subsidies to help the unemployed continue to obtain health insurance, and additional funding for the Supplemental Nutritional Assistance Program. The Act also reduced taxes on unemployment insurance benefits, the effect of which is similar to an expansion of benefits.

Finally, the Recovery Act included direct government investment spending. Because government investment raises output in the short run both through its direct effects and by increasing the incomes and spending of the workers employed on the projects, its output effects are particularly large. In addition, because this type of stimulus is spent less quickly than other types, it will play a vital role in providing support to the economy after 2009. And by funding critical investments, this spending will raise the economy's output even in the long run.

The Act included funding both for traditional government investment projects, such as transportation infrastructure and basic scientific research, and for initial investments to jump-start private investment in emerging new areas, such as health information technology, a smart electrical grid, and clean energy technologies. The Act also included tax credits for specific types of private spending, such as home weatherization and advanced energy manufacturing, which are likely to have effects similar to direct government investment spending. Altogether, roughly one-third of the budget impact of the Recovery Act will take the form of these investments and tax credits.

Fiscal stimulus actions did not end with the passage and implementation of the Recovery Act. In June 2009, the Administration worked with Congress to set up the Car Allowance Rebate System (CARS). Commonly known as the "Cash for Clunkers" program, CARS gave rebates of up to \$4,500 to consumers who replaced older cars and trucks with newer, more fuel-efficient models. The program was in effect for July and most of August. After the program's popularity led to quick exhaustion of the original funding of \$1 billion, the funding was increased to \$3 billion to allow more consumers to participate.

In November, the Worker, Homeownership, and Business Assistance Act of 2009 cut taxes for struggling businesses and strengthened the safety net for workers. In particular, the Act extended the net operating loss provisions of the Recovery Act that allowed small businesses to count their losses this year against taxes paid in previous years for an additional year, and expanded the benefit to medium and large businesses. The Act also provided up to 20 additional weeks of unemployment insurance benefits for workers who were reaching the end of their emergency unemployment benefits. In December, an amendment to the Department of Defense Appropriations Act of 2010 continued through the end of February 2010 the unemployment insurance provisions of the Recovery Act, the November extension of emergency benefits, and the COBRA subsidy program that helps unemployed workers maintain their health insurance. It also expanded the COBRA premium subsidy period from 9 to 15 months and extended the increased guarantees and fee waivers for SBA loans.

### *Housing Policy*

The economic and financial crisis began in the housing market, and an important part of the policy response has been directed at that market. The Administration initiated the Making Home Affordable program (MHA) in March 2009. This program was designed to support low mortgage rates, keep millions of homeowners in their homes, and stabilize the housing market.

As described earlier, the Federal Reserve undertook large-scale purchases of GSE debt and mortgage-backed securities in an effort to reduce mortgage interest rates. At the same time, the Treasury Department made an increased funding commitment to the GSEs. This increased government support for the agencies also reduced their borrowing costs and so helped lower mortgage interest rates.

Importantly, MHA also included a program to help households take advantage of lower interest rates. The Home Affordable Refinance Program helps families whose homes have lost value and whose mortgage payments can be reduced by refinancing at historically low interest rates. This program expanded the opportunity to refinance to borrowers with loans owned or guaranteed by the GSEs who had a mortgage balance up to 125 percent of their home's current value.

Another key component of MHA is the Home Affordable Modification Program (HAMP), which is providing up to \$75 billion to encourage loan modifications. It offers incentives to investors, lenders, servicers, and homeowners to encourage mortgage modifications in which all stakeholders share in the cost of ensuring that responsible homeowners can afford their

monthly mortgage payments. To protect taxpayers, HAMP focuses on sound modifications. No payments are made by the government unless the modification lasts for at least three months, and all the payments are designed around the principle of “pay for success.” All parties have aligned incentives under the program to achieve successful modifications at an affordable and sustainable level.

The Administration has supported additional programs to help the housing sector. The Recovery Act included an \$8,000 first-time homebuyer’s credit for home purchases made before December 1, 2009. As with temporary investment incentives, this credit can help the economy by changing the timing of decisions, bringing buyers into the housing market who were not planning on becoming homeowners until after 2009 or were postponing their purchases in light of the distress in the market. In November, this credit was expanded and extended by the Workers, Homeownership, and Business Assistance Act of 2009.

The Recovery Act also gave considerable resources to the Neighborhood Stabilization Program, a program administered by the Department of Housing and Urban Development to stabilize communities that have suffered from foreclosures and abandoned homes. The Administration also provided assistance to state and local housing finance agencies and their efforts to aid distressed homeowners, stimulate first-time home buying, and provide affordable rental homes. These agencies had faced a significant liquidity crisis resulting from disruptions in financial markets.

## **THE EFFECTS OF THE POLICIES**

The condition of the American economy has changed dramatically in the past year. At the beginning of 2009, financial markets were functioning poorly, house prices were plummeting, and output and employment were in freefall. Today, financial markets have stabilized and credit is starting to flow again, house prices have leveled off, output is growing, and the employment situation is stabilizing. Because of the depth of the economy’s fall, we are a long way from full recovery, and significant challenges remain. But the trajectory of the economy is vastly improved.

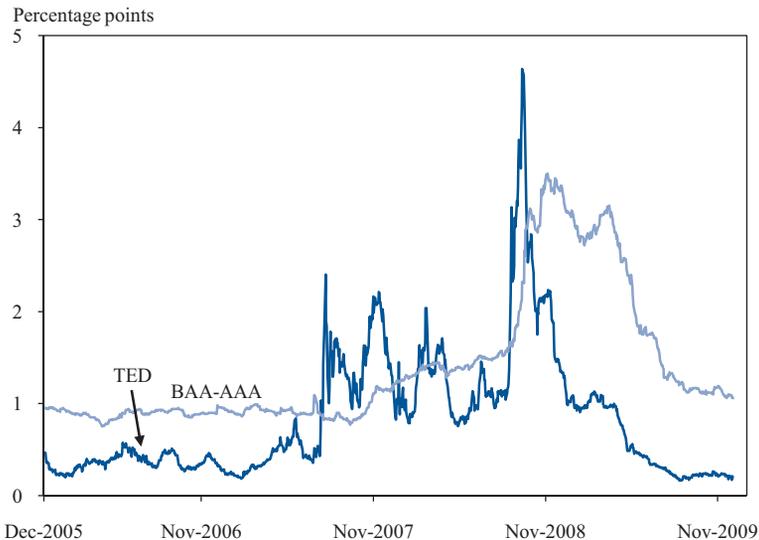
There is strong evidence that the policy response has been central to this turnaround. The actions to stabilize credit markets have prevented further destructive failures of major financial institutions and helped maintain lending in key areas. The housing and mortgage policies have kept hundreds of thousands of homeowners in their homes and brought mortgage rates to historic lows. The speed of the economy’s change in direction has been remarkable and matches up well with the timing of the fiscal

stimulus. And both direct estimates as well as the assessments of expert observers underscore the crucial role played by the stimulus.

### *The Financial Sector*

Given the powerful impact of the financial sector on the real economy, a necessary first step to recovery of the real economy was recovery of the financial sector. And the financial sector has unquestionably begun to recover. Figure 2-5 extends the graph of the TED spread and the BAA-AAA spread shown in Figure 2-3 through December 2009. After spiking to unprecedented levels in October 2008, the TED spread fell rapidly over the next two months but remained substantially elevated at the beginning of 2009. It then declined gradually through August and is now at normal levels. This key indicator of the basic functioning of credit markets suggests substantial financial recovery. The BAA-AAA spread remained very high through April but then fell rapidly from April to September. This spread, which normally rises when the economy is weak because of higher corporate default risks, is now at levels comparable to those at the beginning of the recession and below its levels in much of 1990–91 and 2002–03. Thus, the current level of the spread appears to reflect mainly the weak state of the economy rather than any specific difficulties in credit markets.

Figure 2-5  
TED Spread and Moody's BAA-AAA Spread Through December 2009

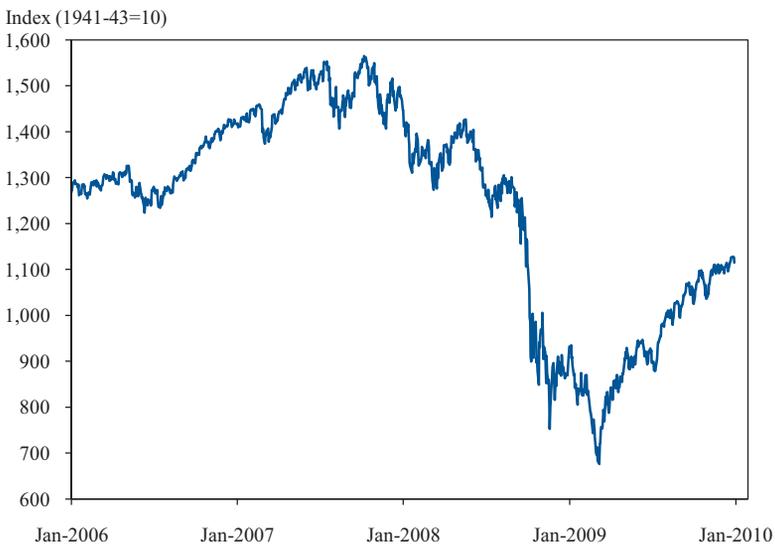


Notes: The TED spread is defined as the three-month London Interbank Offer Rate (LIBOR) less the yield on the three-month U.S. Treasury security. Moody's BAA-AAA spread is the difference between Moody's indexes of yields on AAA and BAA rated corporate bonds.

Source: Bloomberg.

Another broad indicator of the health of the financial system is the level of stock prices, which depend both on investors' expectations of future earnings and on their willingness to bear risk. Figure 2-6 shows the behavior of the S&P 500 stock price index since January 2006. This series declined by 18 percent from its peak in October 2007 through the end of August 2008, fell precipitously in September, and continued to fall through March 2009 as the economy deteriorated sharply and investors became extremely fearful. The stabilization of the economy and the restoration of more normal workings of financial markets have led to a sharp turnaround in stock prices. As of December 31, 2009, the S&P 500 was 65 percent above its low in March. As with the BAA-AAA spread, the current level of stock prices relative to their pre-recession level appears to reflect the weaker situation of the real economy rather than any specific problems with financial markets or investors' willingness to bear risk.

Figure 2-6  
S&P 500 Stock Price Index



Source: Bloomberg.

These indicators show that financial markets have evolved toward normalcy, which was a necessary step in stopping the economic freefall. But for the economy to recover fully, that is not enough: credit must be available to sound borrowers. On this front, the results are more mixed. Some sources of credit are coming back strongly, but others remain weak.

As described in more detail later, one critical market where policies have succeeded in lowering interest rates and maintaining credit flows is

the mortgage market. Another market that has recovered substantially is the market for commercial paper. In late 2008 and early 2009, this market was functioning in large part because of the direct intervention of the Federal Reserve. By mid-January, the Federal Reserve's Commercial Paper Funding Facility (CPFF) was holding \$350 billion of commercial paper. As credit conditions have stabilized, however, firms have been able to place their commercial paper privately on better terms than through the CPFF, and levels of commercial paper outstanding have remained stable even as the Federal Reserve has reduced its holdings to less than \$15 billion. Nonetheless, quantities of commercial paper outstanding remain well below their pre-crisis levels.

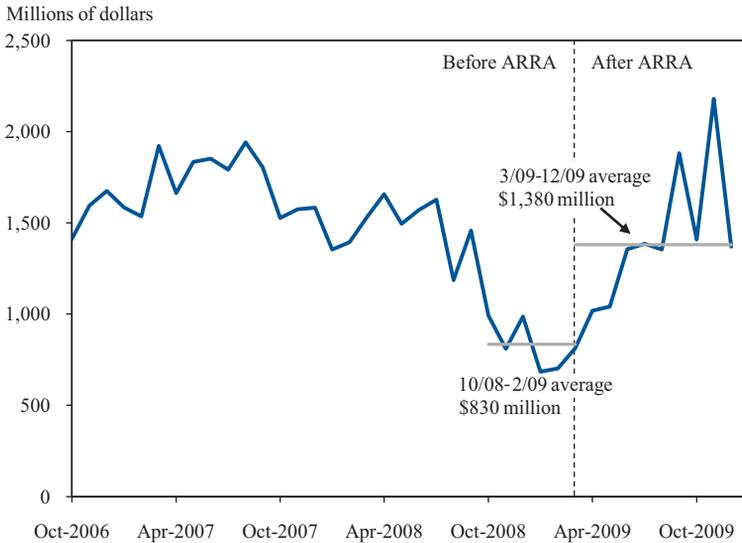
Another crucial source of credit that has stabilized is the market for corporate bonds. As risk spreads have fallen, corporations have found it easier to obtain funding by issuing longer-term bonds than by issuing such instruments as commercial paper. As a result, corporate bond issuance, which fell sharply in the second half of 2008, is now running above pre-crisis levels.

An important financial market development occurred in response to the stress test conducted in the spring. This comprehensive review of the soundness of the Nation's 19 largest financial institutions, together with the public release of this information, strengthened private investors' confidence in the institutions. Partly as a result, the institutions were able to raise \$55 billion in private common equity, improving their capital positions and their ability to lend.

The fact that financial institutions are increasingly able to raise private capital is reducing their need to rely on public capital. Only \$7 billion of TARP funds have been extended to banks since January 20, 2009. Many financial institutions have repaid their TARP funds, and the expected cost of the program to the government has been revised down by approximately \$200 billion since August 2009.

Policy initiatives have also had a clear impact on small business lending. Figure 2-7 shows the amount of SBA-guaranteed loans that have been made since October 2006. SBA loan volume experienced its first significant decrease in September and October 2007; following the failure of Lehman Brothers in September 2008, it fell by more than half. The recovery in small business lending coincided with the passage of the Recovery Act in February 2009. In the months between Lehman's fall and passage of the Recovery Act, average monthly loan volume was \$830 million; immediately after passage, loan volume began to steadily recover and averaged \$1.3 billion per month through September 2009. In September, loan volume reached \$1.9 billion, which was the highest level since August 2007; this has since been exceeded by November 2009's monthly loan volume of

Figure 2-7  
 Monthly Gross SBA 7(a) and 504 Loan Approvals



Source: Unpublished monthly data provided by the Small Business Administration.

\$2.2 billion. In total, between February and December 2009 the SBA guaranteed nearly \$15 billion in small business lending.

Nonetheless, overall credit conditions have not returned to normal. Many small business owners report continued difficulties in obtaining credit. In addition, the severity of the downturn is leading to elevated rates of failure of small banks, potentially disrupting their lending to small businesses and households. The market for asset-backed securities is also far from fully recovered. As a result, it is often hard for banks and other lenders to package and sell their loans, which forces them to hold a greater fraction of the loans they originate and thus limits their ability to lend.

One important source of data on credit availability is the Federal Reserve’s Senior Loan Officer Opinion Survey on Bank Lending Practices. The survey, conducted every three months, examines whether banks are tightening lending standards, loosening them, or keeping them basically unchanged. The October 2008 survey found that the overwhelming majority of banks were tightening standards. This fraction has declined steadily, and by October 2009 less than 20 percent were reporting that they were tightening standards for commercial and industrial loans, though none reported loosening standards. Thus, credit conditions remain tight.

## Housing

As described earlier, policymakers have taken unprecedented actions to maintain mortgage lending. One result has been a major shift in the

composition of mortgage finance. In 2006, private institutions provided 60 percent of liquidity while the GSEs, the Federal Housing Agency (FHA), and the Veterans Administration (VA) provided the remaining 40 percent. As home prices began to decline nationally in 2007, private financing for mortgages began to dry up. As of November 2009, the mortgages guaranteed by the GSEs, FHA, and the VA accounted for nearly all mortgage originations. About 22 percent of mortgage originations are guaranteed by FHA or VA, up from less than 3 percent in 2006. About 75 percent of mortgage originations are guaranteed by the GSEs, up from less than 40 percent in 2006.

As Figure 2-8 shows, mortgage rates fell to historic lows in 2009—consistent with the government’s increased funding commitment to Fannie Mae and Freddie Mac and the Federal Reserve’s purchases of mortgage-backed securities. These low mortgage rates support home prices and thus benefit all homeowners. More directly, households that have refinanced their mortgages at the lower rates have obtained considerable savings. These savings have effects similar to tax cuts, improving households’ financial positions and encouraging spending on other goods. With the help of the Home Affordable Refinance Program, approximately 3 million borrowers have refinanced, putting more than \$6 billion of purchasing power at an annual rate into the hands of households.

Figure 2-8  
30-Year Fixed Rate Mortgage Rate



Note: Contract interest rate for first mortgages.  
Source: Freddie Mac, Primary Mortgage Market Survey.

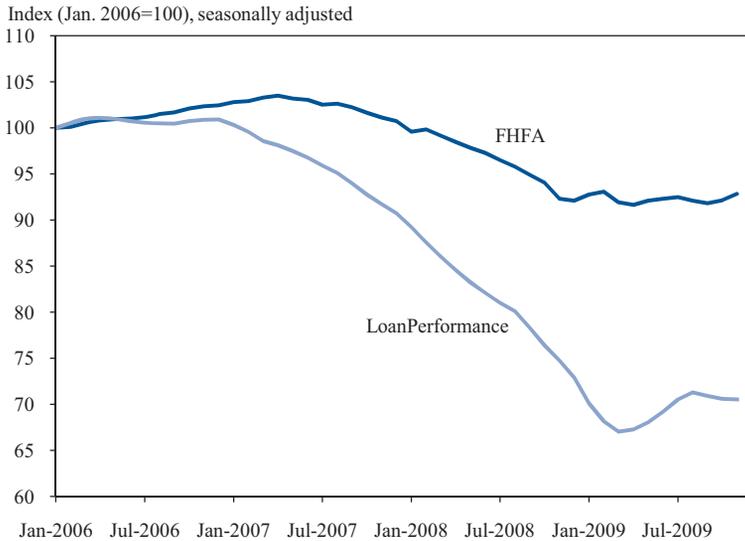
In addition, the Home Affordable Modification Program has been successful in encouraging mortgage modifications. When the program was launched, the Administration estimated that it could offer help to as many as 3 million to 4 million borrowers through the end of 2012. On October 8, 2009, the Administration announced that servicers had begun more than 500,000 trial modifications, nearly a month ahead of the original goal. As of November, the monthly pace of trial modifications exceeded the monthly pace of completed foreclosures. Of course, not all trial modifications will become permanent, but the Administration is making every effort to ensure that as many sound modifications as possible do.

One important result of the policies aimed at the housing market and of the broader policies to support the economy is that the housing market appears to have stabilized. National home price indexes have been relatively steady for the past several months, as shown in Figure 2-9. The Federal Housing Finance Agency purchase-only house price index, which is constructed using only conforming mortgages (that is, mortgages eligible for purchase by the GSEs), has changed little since late 2008. The LoanPerformance house price index, another closely watched measure that uses conforming and nonconforming mortgages with coverage of repeat sales transactions for more than 85 percent of the population, rose 6 percent between March and August 2009 before declining slightly in recent months. In addition, the pace of sales of existing single-family homes has increased substantially. Sales in the fourth quarter of 2009 were 29 percent above their low in the first quarter of 2009 and comparable to levels in the first half of 2007.

Finally, there are signs of renewed building activity. After falling 81 percent from their peak in September 2005 to their low in January 2009, single-family housing permits (a leading indicator of housing construction) rose 49 percent through December 2009. Similarly, after falling for 14 consecutive quarters, the residential investment component of real GDP rose in the third and fourth quarters of 2009.

Inventories of vacant homes for sale remain at high levels, and many vacant homes are being held off the market and will likely be put up for sale as home prices increase. This overhang may lead to some additional price declines, although prices are unlikely to fall at the same rate as they did during the crisis. Thus, the recovery of the housing sector is likely to be slow. Of course, we should neither expect nor want the housing market to return to its pre-crisis condition. In the long run, as discussed in more detail in Chapter 4, neither the extraordinarily high levels of housing construction and price appreciation before the crisis nor the extraordinarily low levels of construction and the rapid price declines during the crisis are sustainable.

Figure 2-9  
FHFA and LoanPerformance National House Price Indexes



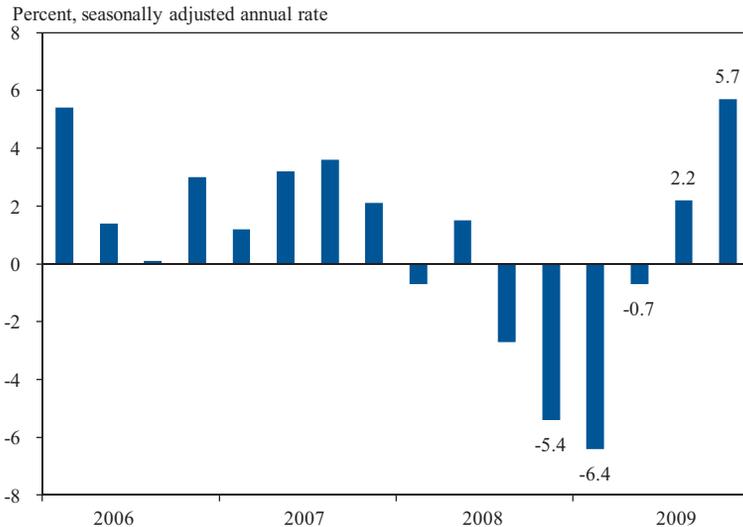
Sources: Federal Housing Finance Agency, purchase-only index; First American Core Logic LoanPerformance.

### ***Overall Economic Activity***

The direction of overall economic activity changed dramatically over the course of 2009. Figure 2-10 shows the quarterly growth rate of real GDP, the broadest indicator of national production. After falling at an annual rate of 6.4 percent in the first quarter, real GDP declined at a rate of just 0.7 percent in the second quarter. It then grew at a 2.2 percent rate in the third quarter and a 5.7 percent rate in the fourth. Such a rapid turnaround in growth is remarkable. The improvement in growth of 8.6 percentage points from the first quarter to the third quarter (that is, the swing from growth at a -6.4 percent rate to growth at a 2.2 percent rate) was the largest since 1983. Similarly, the three-quarter improvement from the first quarter to the fourth of 12.1 percentage points was the largest since 1981, and the second largest since 1958.

One limitation of these simple statistics is that they do not account for the usual dynamics of the economy. A more sophisticated way to gauge the extent of the change in the economy's direction is to compare the path the economy has followed with the predictions of a statistical model. There are many ways to construct a baseline statistical forecast. The particular one used here is a vector autoregression (or VAR) that includes the logarithms of real GDP (in billions of chained 2005 dollars) and payroll employment (in thousands, in the final month of the quarter), using four lags of each variable

Figure 2-10  
Real GDP Growth



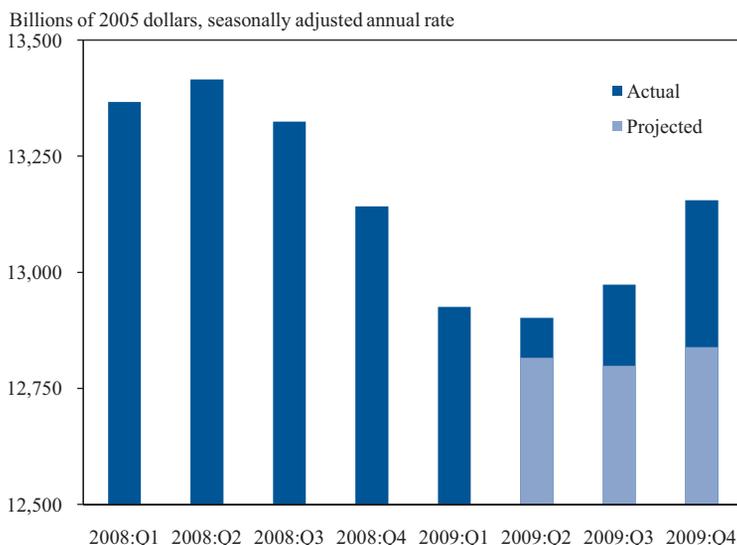
Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.1, line 1.

and estimated over the period 1990:Q1–2007:Q4. Because the sample period ends in the fourth quarter of 2007, the coefficient estimates used to construct the forecast are not influenced by the current recession. Rather, they show the normal joint short-run dynamics of real GDP and employment over an extended period. GDP and employment are then forecast for the final three quarters of 2009 using the estimated VAR and actual data through the first quarter of the year. The resulting comparison of the actual and projected paths of the economy shows the differences between the economy’s actual performance and what one would have expected given the situation as of the first quarter and the economy’s usual dynamics.<sup>1</sup> Although the results presented here are based on one specific approach to constructing the baseline projection, other reasonable approaches have similar implications.

This more sophisticated exercise also finds that the economy’s turnaround has been impressive. The statistical forecast based on the economy’s normal dynamics projects growth at a -3.3 percent rate in the second quarter of 2009, -0.5 percent in the third, and 1.3 percent in the fourth. In all three quarters, actual growth was substantially higher than the projection. Figure 2-11 shows that as a result, the *level* of GDP exceeded the projected level by an increasing margin: 0.7 percent in the second quarter, 1.4 percent in the third quarter, and 2.5 percent in the fourth.

<sup>1</sup> For more details on this approach and the model-based approach discussed later, see Council of Economic Advisers (2010).

Figure 2-11  
Real GDP: Actual and Statistical Baseline Projection



Sources: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.6, line 1; CEA calculations. See Council of Economic Advisers (2010).

The gap between the actual and projected paths of GDP provides a rough way to estimate the effect of economic policy. The most obvious sources of the differences are the unprecedented policy actions. However, the gap reflects all unusual influences on GDP. For example, the rescue actions taken in other countries (described in Chapter 3) could have played a role in better American performance. At the same time, the continuing stringency in credit markets is likely lowering output relative to its usual cyclical patterns. Thus, while some factors work in the direction of causing the comparison of the economy's actual performance with its normal behavior to overstate the contribution of economic policy actions, others work in the opposite direction.

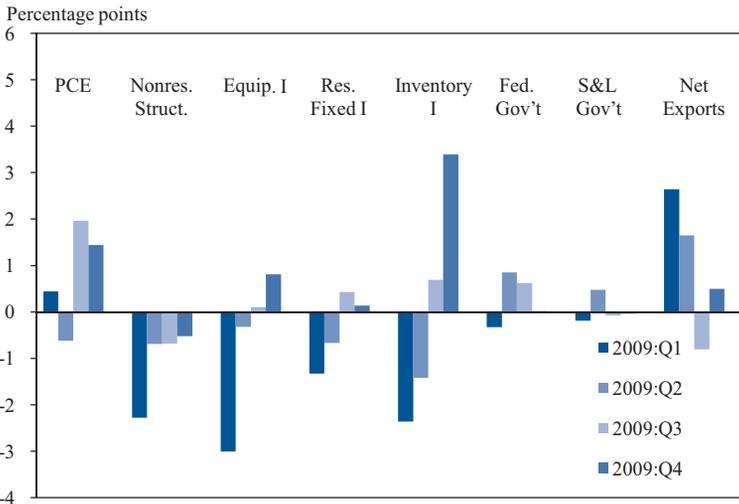
One way to estimate the specific impact of the Recovery Act is to use estimates from economic models. Mainstream estimates of economic multipliers for the effects of fiscal policy can be combined with figures on the stimulus to date to estimate how much the stimulus has contributed to growth. (For the financial and housing policies, this approach is not feasible, because the policies are so unprecedented that no estimates of their effects are readily available.) When this exercise is performed using the multipliers employed by the Council of Economic Advisers (CEA), which are based on mainstream economic models, the results suggest a critical role for the fiscal stimulus. They suggest that the Recovery Act contributed approximately 2.8

percentage points to *growth* in the second quarter, 3.9 percentage points in the third, and 1.8 percentage points in the fourth. As a result, this approach suggests that the *level* of GDP in the fourth quarter was slightly more than 2 percent higher than it would have been in the absence of the stimulus.

Knowledgeable outside observers agree that the Recovery Act has increased output substantially relative to what it otherwise would have been. For example, in November 2009, CBO estimated that the Act had raised the level of output in the third quarter by between 1.2 and 3.2 percent relative to the no-stimulus baseline (Congressional Budget Office 2009a). Private forecasters also generally estimate that the Act has raised output substantially.

A final way to look for the effects of the rescue policies on GDP is in the behavior of the components of GDP. Figure 2-12 shows the contribution of various components of GDP to overall GDP growth in each of the four quarters of 2009. One area where policy’s role seems clear is in business investment in equipment and software. A key source of the turnaround in GDP is the change in this type of investment from a devastating 36 percent annual rate of decline in the first quarter to a 13 percent rate of increase by the fourth quarter. Two likely contributors to this change were the investment incentives in the Recovery Act and the many measures to stabilize the financial system and maintain lending. Similarly, the housing and financial

Figure 2-12  
Contributions to Real GDP Growth



Notes: Bars sum to quarterly change in GDP growth (-6.4% in Q1; -0.7% in Q2; 2.2% in Q3; 5.7% in Q4). PCE is personal consumption expenditures; Nonres. Struct. is nonresidential fixed investment in structures; Equip I. is nonresidential fixed investment in equipment and software; Res. Fixed I is residential fixed investment; Inventory I is inventory investment; Federal Gov't is Federal Government purchases; S&L Gov't is state and local government purchases; Net Exports is net exports.  
Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.2.

market policies were surely important to the swing in the growth of residential investment from a 38 percent annual rate of decline in the first quarter to increases in the third and fourth quarters.

Two other components showing evidence of the policies' effects are personal consumption expenditures and state and local government purchases. The Making Work Pay tax credit and the aid to individuals directly affected by the recession meant that households did not have to cut their consumption spending as much as they otherwise would have, and the Cash for Clunkers program provided important incentives for motor vehicle purchases in the third quarter. Consumption was little changed in the first two quarters of 2009 and then rose at a healthy 2.8 percent annual rate in the third quarter—driven in considerable part by a 44 percent rate of increase in purchases of motor vehicles and parts—and at a 2.0 percent rate in the fourth quarter. And, despite the dire budgetary situations of state and local governments, their purchases rose at the fastest pace in more than five years in the second quarter and were basically stable in the third and fourth quarters. This stability almost surely could not have occurred in the absence of the fiscal relief to the states.

The figure also shows the large role of inventory investment in magnifying macroeconomic fluctuations. When the economy goes into a recession, firms want to cut their inventories. As a result, inventory investment moves from its usual slightly positive level to sharply negative, contributing to the fall in output. Then, as firms moderate their inventory reductions, inventory investment rises—that is, becomes less negative—contributing to the recovery of output.

Finally, the turnaround in the automobile industry has been substantial. The Cash for Clunkers program appears to have generated a sharp increase in demand for automobiles in July and August 2009 (Council of Economic Advisers 2009). Sales of light motor vehicles averaged 12.6 million units at an annual rate during these two months, up from an annual rate of 9.6 million units in the second quarter. Although some observers had hypothesized that the July and August sales boost would be offset by a corresponding loss of sales in the months immediately following, sales in September (9.2 million at an annual rate) roughly matched the pace of sales in the first half of 2009, and sales subsequently rebounded to a 10.8 million unit annual pace in the fourth quarter. Employment in motor vehicles and parts hit a low of 633,300 in June 2009 and has increased modestly since then. In December 2009, employment was 655,200.

Both GM and Chrysler proceeded through bankruptcy in an efficient manner, and the new companies emerged far more quickly than outside experts thought would be possible. The companies are performing in line

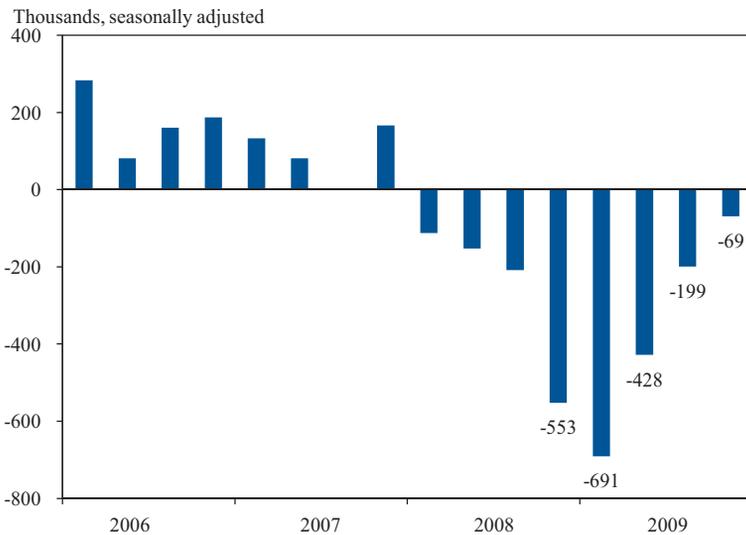
with their restructuring plans, and in November 2009, GM announced its intention to begin repaying the Federal Government earlier than originally expected. It made a first payment of \$1 billion in December.

### ***The Labor Market***

The ultimate goal of the economic stabilization and recovery policies is to provide a job for every American who seeks one. The recession's impact on the labor market has been severe: employment in December 2009 was 7.2 million below its peak level two years earlier, and the unemployment rate was 10 percent. Moreover, although real GDP has begun to grow, employment losses are continuing.

Nonetheless, there is clear evidence that the labor market is stabilizing. Figure 2-13 shows the average monthly job loss by quarter since 2006. Average monthly job losses have moderated steadily, from a devastating 691,000 in the first quarter of 2009 to 428,000 in the second quarter, 199,000 in the third, and 69,000 in the fourth. The *change* in the average monthly change in employment from the first quarter to the third was the largest over any two-quarter period since 1980, and the change from the first to the fourth quarter was the largest three-quarter change since 1946. Given what we now know about the terrible rate of job loss over the winter, it would have been very difficult for the labor market to stabilize more rapidly than it has.

Figure 2-13  
Average Monthly Change in Employment

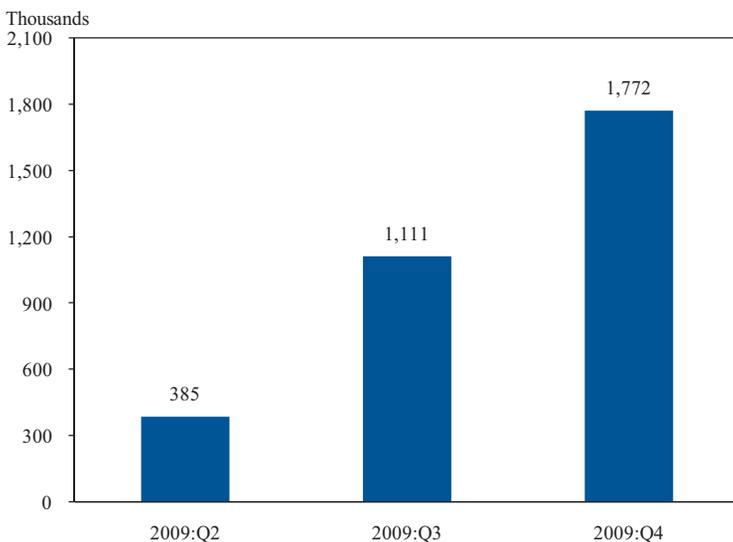


Source: Department of Labor (Bureau of Labor Statistics), Current Employment Statistics survey Series CES0000000001.

One can again use the VAR described earlier to obtain a more refined estimate of how the behavior of employment has differed from its usual pattern. This statistical procedure implies that given the economy's behavior through the first quarter of 2009 and its usual dynamics, one would have expected job losses of about 597,000 per month in the second quarter, 513,000 in the third quarter, and 379,000 in the fourth. Thus, actual employment as of the middle of the second quarter (May) was approximately 300,000 higher than one would have projected given the normal behavior of the economy; as of the middle of the third quarter (August), it was about 1.1 million higher; and as of the middle of the fourth quarter (November), it was about 2.1 million higher. As with the behavior of GDP, the portion of this difference that is attributable to the Recovery Act and other policies cannot be isolated from the portion resulting from other factors. But again, the difference could either understate or overstate the policies' contributions.

As with GDP, economic models can be used to focus specifically on the contributions of the Recovery Act. The results are shown in Figure 2-14. The CEA's multiplier estimates suggest that the Act raised employment relative to what it otherwise would have been by about 400,000 in the second quarter of 2009, 1.1 million in the third quarter, and 1.8 million in the fourth quarter. Again, these estimates are similar to other assessments. For example, CBO's November report estimated that the Act had raised

Figure 2-14  
Estimated Effect of the Recovery Act on Employment



Note: The figure shows the estimated impact on employment relative to what otherwise would have happened.  
Source: CEA calculations. See Council of Economic Advisers (2010).

employment in the third quarter by between 0.6 million and 1.6 million, relative to what otherwise would have happened.

A more complete picture of the process of labor market healing can be obtained by looking at labor market indicators beyond employment. Table 2-1 shows some of the main margins along which labor market recovery occurs. The margins are listed from left to right in the rough order in which they tend to adjust coming out of a recession. One of the first margins to respond is productivity—when demand begins to recover or moderates relative to the previous rate of decline, firms initially produce more with the same number of workers. Another early margin is initial claims for unemployment insurance—fewer workers are laid off. A somewhat later margin is the average workweek—firms start increasing production by increasing hours. The usual next step is temporary help employment—when firms decide to hire, they often begin with temporary help. Eventually total employment responds. The unemployment rate usually lags employment slightly because employment growth brings some discouraged workers back into the labor force and because the labor force naturally grows over time. The last item to adjust is usually the duration of unemployment spells, as workers who have been unemployed for extended periods finally find jobs.

The table shows that recovery from this recession is following the typical pattern, with labor market repair evident along the margins that typically respond early in a recovery. Productivity growth has surged as GDP has begun to increase and employment has continued to fall.

Table 2-1  
Cyclically Sensitive Elements of Labor Market Adjustment  
First to move  $\longrightarrow$  Last to move

	Productivity growth, annual rate (percent)	Average monthly change					
		Initial UI claims (thousands/week)	Work-week (hours)	Temporary help employment (thousands)	Total employment (thousands)	Unemployment rate (percent)	Average duration of unemployment (weeks)
2008:Q4	0.8	22	-0.10	-70	-553	0.39	0.3
2009:Q1	0.3	40	-0.07	-73	-691	0.42	0.4
2009:Q2	6.9	-15	-0.03	-28	-428	0.29	1.2
2009:Q3	8.1 <sup>P</sup>	-22	0.03	5	-199	0.11	0.7
2009:Q4	7.5 <sup>e</sup>	-30	0.03	49	-69	0.04	0.9

Notes: This table arranges the indicators according to the order in which they typically first move around business cycle turning points. Quarterly values for the average monthly change are measured from the last month in the previous quarter to the last month in the quarter. p is preliminary; e is estimate.

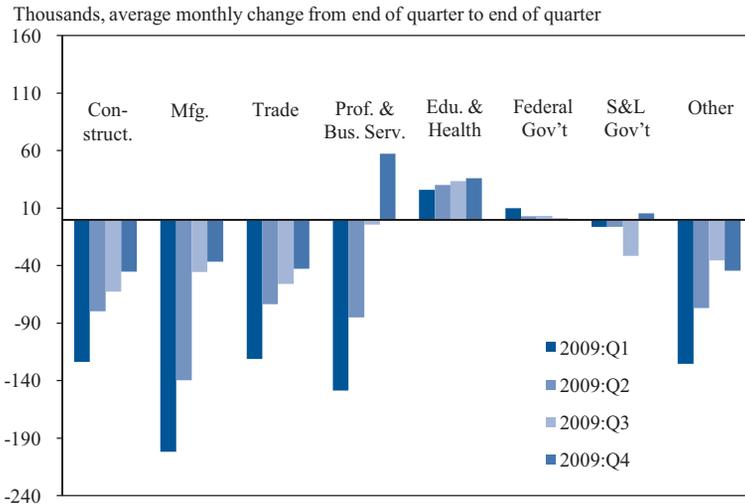
Sources: Department of Labor (Bureau of Labor Statistics), Series PRS85006092, and Employment Situation Tables A, A-9, and B-1; Department of Labor (Employment and Training Administration).

Initial unemployment insurance claims, which rose precipitously earlier in the recession, have begun to decline at an increasing rate. Likewise, the workweek has gone from shortening to lengthening, albeit slowly. Temporary help employment has changed from extreme declines to substantial increases. So far, total employment has shown a greatly moderating decline but has not yet risen. The pace of increase in the unemployment rate has slowed noticeably, but the unemployment rate has not yet fallen on a quarterly basis. Finally, increases in the duration of unemployment have not yet begun to moderate noticeably.

These data suggest that the labor market is beginning to move in the right direction, but much work remains to be done. The country is not yet seeing the substantial rises in total employment and declines in the unemployment rate that are the ultimate hallmark of robust labor market improvement. And, of course, even once all the indicators are moving solidly in the right direction, the labor market will still have a long way to go before it is fully recovered.

Signs of healing are also beginning to appear in the industrial composition of the stabilization of the labor market. Figure 2-15 shows the average monthly change in each of eight sectors in each of the four quarters of 2009. As one would expect of the beginnings of a recovery from a severe

Figure 2-15  
Contributions to the Change in Employment



Notes: Bars sum to average monthly change in quarter (-691,000 in Q1; -428,000 in Q2; -199,000 in Q3; -69,000 in Q4). Construct. is construction; Mfg. is manufacturing; Trade is wholesale and retail trade, transportation, and utilities; Prof. & Bus. Serv. is professional and business services; Edu. & Health is education and health; Federal Gov't is Federal Government; S&L Gov't is state and local government.  
Source: Department of Labor (Bureau of Labor Statistics), Employment Situation Table B-1.

recession, the moderation in job losses has been particularly pronounced in manufacturing and construction, two of the most cyclically sensitive sectors. There has also been a sharp turnaround in professional business services, driven largely by renewed employment growth in temporary help services.

One area where the Recovery Act appears to have had a direct impact on employment is in state and local government. Despite the enormous harm the recession has done to their budgets, employment in state and local governments has fallen relatively little. Indeed, employment in state and local government, particularly in public education, rose in the fourth quarter.

## THE CHALLENGES AHEAD

The financial and economic rescue policies have helped avert an economic calamity and brought about a sharp change in the economy's direction. Output has begun growing again, and employment appears poised to do so as well. But even when the country has returned to a path of steadily growing output and employment, the economy will be far from fully recovered. Since the recession began in December 2007, 7.2 million jobs have been lost. It will take many months of robust job creation to erase that employment deficit. For this reason, it is important to explore policies to speed recovery and spur job creation.

### *Deteriorating Forecasts*

This jobs deficit is much larger than the vast majority of observers anticipated at the end of 2008. This is not the result of a slow economic turnaround. On the contrary, as described above, the change in the economy's direction has been remarkably rapid given the economy's condition in the first quarter of 2009. Rather, the jobs deficit reflects two developments.

The first development is the unanticipated severity of the downturn in the real economy in 2008 and early 2009. Table 2-2 shows consensus forecasts from November 2008 through February 2009, along with preliminary and actual estimates of real GDP growth. The table shows that the magnitude of the fall in GDP in the fourth quarter of 2008 and the first quarter of 2009—driven in part by the unexpectedly strong spread of the crisis to the rest of the world—surprised most observers. The Blue Chip Consensus released in mid-December 2008 projected fourth quarter growth would be -4.1 percent and first quarter growth would be -2.4 percent. The actual values turned out to be -5.4 percent and -6.4 percent. The Blue Chip forecast released in mid-January also projected a substantially smaller decline in first quarter real GDP than actually occurred.

Table 2-2  
Forecast and Actual Macroeconomic Outcomes

Real GDP Growth					
	2008:Q4	2009:Q1	2009:Q2	2009:Q3	2009:Q4
Blue Chip (11/10/08)	-2.8	-1.5	0.2	1.5	2.1
SPF (11/17/08)	-2.9	-1.1	0.8	0.9	2.3
Blue Chip (12/10/08)	-4.1	-2.4	-0.4	1.2	1.9
Blue Chip (1/10/09)	-5.2	-3.3	-0.8	1.2	2.2
SPF (2/13/09)	--	-5.2	-1.8	1.0	1.8
BEA Advance Estimate	-3.8	-6.1	-1.0	3.5	5.7
BEA Preliminary (2nd) Estimate	-6.2	-5.7	-1.0	2.8	--
<b>Actual</b>	<b>-5.4</b>	<b>-6.4</b>	<b>-0.7</b>	<b>2.2</b>	<b>--</b>

Unemployment Rate					
	2008:Q4	2009:Q1	2009:Q2	2009:Q3	2009:Q4
Blue Chip (11/10/08)	6.5	6.9	7.3	7.6	7.7
SPF (11/17/08)	6.6	7.0	7.4	7.6	7.7
Blue Chip (12/10/08)	6.7	7.3	7.7	8.0	8.1
Blue Chip (1/10/09)	6.9	7.4	7.9	8.3	8.4
SPF (2/13/09)	--	7.8	8.3	8.7	8.9
<b>Actual</b>	<b>6.9</b>	<b>8.2</b>	<b>9.3</b>	<b>9.7</b>	<b>10.0</b>

Notes: In the GDP panel, all numbers are in percent and are seasonally adjusted annual rates. In the unemployment panel, all numbers are in percent and are seasonally adjusted. SPF is the Survey of Professional Forecasters. Dashes indicate data are not available.

Sources: Blue Chip Economic Indicators; Survey of Professional Forecasters; Department of Commerce (Bureau of Economic Analysis), GDP news releases on 1/30/2009, 2/27/2009, 4/29/2009, 5/29/2009, 7/31/2009, 8/27/2009, 10/29/2009, 11/24/2009, 1/29/2010, and National Income and Product Accounts Table 1.1.1, line 1; Department of Labor (Bureau of Labor Statistics), Current Population Survey Series LNS14000000.

Part of the difficulty in forecasting resulted from large data revisions. The official GDP figures available at the end of January 2009 indicated that real GDP had fallen by just 0.2 percent over the four quarters of 2008; revised data now put the decline at 1.9 percent.

The Administration's economic forecast made in January 2009 and released with the fiscal 2010 budget, like the private forecasts, underestimated the speed of GDP decline in the first quarter. It also underestimated average growth over the remaining three quarters of 2009. For the four quarters of 2009, the Administration forecast overall growth of 0.3 percent; the actual value, according to the latest available data, is 0.1 percent.

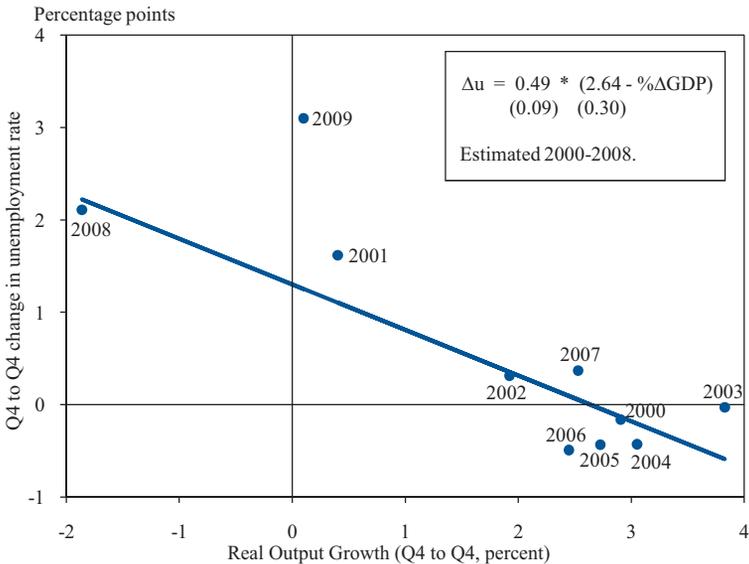
The second development accounting for the unexpectedly large jobs deficit involves the behavior of the labor market given the behavior of GDP. Table 2-2 also shows consensus forecasts for the unemployment rate. These data indicate that as of December 2008, unemployment in the fourth quarter of 2009 was forecast to be 8.1 percent, dramatically less than the actual value of 10.0 percent. As of mid-January 2009, unemployment was forecast to be 8.4 percent in the fourth quarter. In its forecast made in

January 2009, the Administration unemployment forecast was similar to the consensus forecast.

Some of the unanticipated rise in unemployment was the result of the worse-than-expected GDP growth in 2008 and the beginning of 2009. CEA analysis, however, also suggests that the normal relationship between GDP and unemployment has fit poorly in the current recession. This relationship, termed Okun's law after former CEA Chair Arthur Okun who first identified it, suggests that a fall in GDP of 1 percent relative to its normal trend path is associated with a rise in the unemployment rate of about 0.5 percentage point after four quarters. Figure 2-16 shows the scatter plot of the four-quarter change in real GDP and the four-quarter change in the unemployment rate. The figure shows that although the fit of Okun's law is usually good, the relationship has broken down somewhat during this recession. The error was concentrated in 2009, when the unemployment rate increased considerably faster than might have been expected given the change in real GDP. CEA calculations suggest that as of the fourth quarter of 2009, the unemployment rate was approximately 1.7 percentage points higher than would have been expected given the behavior of real GDP since the business cycle peak in the fourth quarter of 2007.

This unusual rise in the unemployment rate does not appear to result from unusual behavior of the labor force. If anything, the labor force

Figure 2-16  
Okun's Law, 2000-2009



Sources: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.1, line 1; Department of Labor (Bureau of Labor Statistics), Current Population Survey Series LNS11000000 and LNS113000000; CEA calculations.

appears to have contracted somewhat more than usual given the path of the economy. Rather it reflects larger-than-typical falls in employment relative to the decline in GDP. This behavior is consistent with the tremendous increase in productivity during this episode, especially over the final three quarters of 2009. Indeed, labor productivity rose at a 6.9 percent annual rate in the second quarter and at an 8.1 percent rate in the third quarter; if productivity rose by a similar amount in the fourth quarter, as seems likely, the increase will have been one of the fastest over three quarters in postwar history.

### *The Administration Forecast*

Looking forward, the Administration projects steady but moderate GDP growth over the near and medium term. Table 2-3 reports the Administration’s forecast used in preparing the President’s fiscal year 2011 budget. The table shows that GDP growth in 2010 is forecast to be 3 percent.

Table 2-3  
Administration Economic Forecast

	Nominal GDP	Real GDP (chain- type)	GDP price index (chain- type)	Con- sumer price index (CPI-U)	Un- emp- loy- ment rate (percent)	Interest rate, 91-day Treasury bills (percent)	Interest rate, 10-year Treasury notes (percent)	Nonfarm payroll employ- ment (average monthly change, Q4 to Q4, thous- ands)
	Percent change, Q4 to Q4				Level, calendar year			
2008 (actual)	0.1	-1.9	1.9	1.5	5.8	1.4	3.7	-189
2009	0.4	-0.5	0.9	1.4	9.3	0.2	3.3	-419
2010	4.0	3.0	1.0	1.3	10.0	0.4	3.9	95
2011	5.7	4.3	1.4	1.7	9.2	1.6	4.5	190
2012	6.1	4.3	1.7	2.0	8.2	3.0	5.0	251
2013	6.0	4.2	1.7	2.0	7.3	4.0	5.3	274
2014	5.7	3.9	1.7	2.0	6.5	4.1	5.3	267
2015	5.2	3.4	1.7	2.0	5.9	4.1	5.3	222
2016	5.0	3.1	1.8	2.1	5.5	4.1	5.3	181
2017	4.5	2.7	1.8	2.1	5.3	4.1	5.3	139
2018	4.5	2.6	1.8	2.1	5.2	4.1	5.3	113
2019	4.4	2.5	1.8	2.1	5.2	4.1	5.3	98
2020	4.3	2.5	1.8	2.1	5.2	4.1	5.3	93

Notes: Based on data available as of November 18, 2009. Interest rate on 91-day Treasury bills is measured on a secondary market discount basis. The figures do not reflect the upcoming BLS benchmark revision, which is expected to reduce 2008 and 2009 job growth by a cumulative 824,000 jobs.

Sources: CEA calculations; Department of Commerce (Bureau of Economic Analysis and Economics and Statistics Administration); Department of Labor (Bureau of Labor Statistics); Department of the Treasury; Office of Management and Budget.

The Administration estimates that normal or potential GDP growth will be roughly 2½ percent per year (see Box 2-1). Because projected GDP growth is only slightly stronger than potential growth, relatively little decline is projected in the unemployment rate during 2010. Indeed, it is possible that the rate will rise for a while as some discouraged workers return to the labor force, before starting to generally decline. Consistent with this, employment growth is projected to be roughly equal to normal trend growth of about 100,000 per month.

**Box 2-1: Potential Real GDP Growth**

The Administration forecast is based on the idea that real GDP fluctuates around a potential level that trends upward at a relatively steady rate. Over the budget window, potential real GDP is projected to grow at a 2.5 percent annual rate. Potential real GDP growth is a measure of the sustainable rate of growth of productive capacity.

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 these supply side factors to potential real GDP growth is shown in the accompanying table.

Component	Contribution (Percentage points)
Civilian noninstitutional population aged 16+	1.0
Labor force participation rate	-0.3
Employment rate	0.0
Ratio of nonfarm business employment to household employment	-0.0
Average weekly hours (nonfarm business)	-0.1
Output per hour (productivity, nonfarm business)	2.3
Ratio of real GDP to nonfarm business output	-0.4
<b>SUM: Real GDP</b>	<b>2.5</b>

Note: All contributions are in percentage points at an annual rate.  
Sources: CEA calculations; Department of the Treasury; Office of Management and Budget.

Over the next 11 years, the working-age population is projected to grow 1.0 percent per year, the rate projected by the Census Bureau.

*Continued on next page*

*Box 2-1, continued*

The normal or potential labor force participation rate, which fell at a 0.3 percent annual rate during the past 8 years, is expected to continue declining at that pace. The continued projected decline results from the aging baby boom generation entering their retirement years. The potential employment rate (that is, 1 minus the normal or potential unemployment rate) is not expected to contribute to potential GDP growth because no change is anticipated in the unemployment rate consistent with stable inflation. The potential ratio of nonfarm business employment to household employment is also expected to be flat during the forecast horizon—consistent with its average behavior in the long run. This would be a change, however, from its puzzling 0.5 percent annual rate of decline during the past business cycle. The potential workweek is projected to edge down slightly (0.1 percent per year). This is a slightly shallower pace of decline than over the past 50 years, when it declined 0.3 percent per year. Over the 11-year projection interval, some firming of the workweek would be a natural labor market accommodation to the anticipated decline in labor force participation.

Potential growth of labor productivity is projected at 2.3 percent per year, a conservative forecast relative to its measured product-side growth rate (2.8 percent) between the past two business cycle peaks, but close to an alternative income-side measure of productivity growth (2.2 percent) during the same period. The ratio of real GDP to nonfarm business output is expected to continue to subtract from overall growth as it has over most long periods, because the nonfarm business sector generally grows faster than other sectors, such as government, households, and nonprofit institutions. Together, the sum of all of the components is the growth rate of potential real GDP, which is 2.5 percent per year.

As Table 2-3 shows, actual real GDP is projected to grow more rapidly than potential real GDP over most of the forecast horizon. The most important reason for the difference is that the actual employment rate is projected to rise as millions of workers who are currently unemployed return to employment and so contribute to GDP growth.

Traditionally, the large amount of slack would be expected to put substantial downward pressure on wage and price inflation. For this reason, inflation is projected to remain low in 2010. However, because inflationary expectations remain well anchored, inflation is not likely to slow dramatically or become negative (that is, turn into deflation).

In 2011, slightly higher GDP growth of approximately 4 percent is projected (again measured from fourth quarter to fourth quarter). Consistent with this, stronger employment growth and a more substantial decline in the unemployment rate are expected in 2011. However, because GDP growth is still not projected to be as robust as that following some other deep recessions, continued large output gaps are anticipated. This will limit the upward movement of the inflation rate toward a pace consistent with the Federal Reserve's long-term target inflation rate of about 2 percent. Moreover, employment growth is unlikely to be large enough to reduce the employment shortfall dramatically in 2011.

### ***Responsible Policies to Spur Job Creation***

This large employment gap and the prospects that it is likely to recede only slowly make a compelling case for additional measures to spur private sector job creation. The Administration is therefore exploring a range of possibilities and working with Congress to pass measures into law.

Several principles are guiding this process. First, at a time when the budget deficit is large and the country faces significant long-run fiscal challenges, measures must be cost-effective. Second, given that the employment consequences of the recession have been severe, measures must focus particularly on job creation. And third, measures must be tailored to the state of the economy: the policies that are appropriate when an economy is contracting rapidly may not be the same as those that are appropriate for an economy that is growing again but operating below capacity.

Guided by these principles, the Administration has identified three key priorities. One is a multifaceted program to jump-start job creation by small businesses, which are critical to growth and have been particularly harmed by the recession. Among the possible policies in this area are investment incentives, tax incentives for hiring, and additional steps to increase the availability of loans backed by the Small Business Administration. These policies may be particularly effective at a time when the economy is growing—so that the question for many firms is not whether to hire but when—and at a time when credit availability remains an important constraint.

Initiatives to encourage energy efficiency and clean energy are another priority. One proposal involves incentives for homeowners to retrofit their homes for energy efficiency. Because in many cases the effect of such incentives would be to lead homeowners to make cost-saving investments earlier than they otherwise would have, they might have an especially large impact. In addition, the employment effects would be concentrated in construction, an area that has been particularly hard-hit by the recession.

The Administration has also supported extending tax credits through the Department of Energy that promote the manufacture of advanced energy products and providing incentives to increase the energy efficiency of public and nonprofit buildings.

A third priority is infrastructure investment. The experience of the Recovery Act suggests that spending on infrastructure is an effective way to put people back to work while creating lasting investments that raise future productivity. For this reason, the Administration is supporting an additional investment of up to \$50 billion in roads, bridges, airports, transit, rail, and water projects. Funneling some of these funds through programs such as the Transportation Investment Generating Economic Recovery (TIGER) program at the Department of Transportation, which is a competitive grant program, could offer a way to ensure that the projects with the highest returns receive top priority.

Finally, it is critical to maintain our support for the individuals and families most affected by the recession by extending the emergency funding for such programs as unemployment insurance and health insurance subsidies for the unemployed. This support not only cushions the worst effects of the downturn, but also boosts spending and so spurs job creation. Similarly, it is important to maintain support for state and local governments. The budgets of these governments remain under severe strain, and many are cutting back in anticipation of fiscal year 2011 deficits. Additional fiscal support could therefore have a rapid impact on spending, and would do so by maintaining crucial services and preventing harmful tax increases.

## CONCLUSION

The recession that began at the end of 2007 became the “Great Recession” following the financial crisis in the fall of 2008. In the wake of the collapse of Lehman Brothers in September, American families faced devastating job losses, high unemployment, scarce credit, and lost wealth. Late 2008 and 2009 will be remembered as a time of great trial for American workers, businesses, and families.

But 2009 should also be remembered as a year when even more tragic losses and dislocation did not occur. As terrible as this recession has been, a second Great Depression would have been far worse. Had policymakers not responded as aggressively as they did to shore up the financial system, maintain demand, and provide relief to those directly harmed by the downturn, the outcome could have been much more dire.

As 2010 begins, there are strong signs that the American economy is starting to recover. Housing and financial markets appear to have stabilized

and real GDP is growing again. The labor market also appears to be healing, showing the expected early pattern of response to output expansion.

With millions of Americans still unemployed, much work remains to restore the American economy to health. It will take a prolonged and robust GDP expansion to eliminate the large jobs deficit that has opened up over the course of the recession. Only when the unemployment rate has returned to normal levels and families are once again secure in their jobs, homes, and savings will this terrible recession truly be over.



## CHAPTER 3

# CRISIS AND RECOVERY IN THE WORLD ECONOMY

The financial crisis and recession have affected economies around the globe. The impact on the U.S. economy has been severe, but many areas of the world have fared even worse. The average growth rate of real gross domestic product (GDP) around the world was -6.2 percent at an annual rate in the fourth quarter of 2008 and -7.5 percent in the first quarter of 2009. All told, the world economy is expected to have contracted 1.1 percent in 2009 from the year before—the first annual decline in world output in more than half a century.<sup>1</sup> Although economic dislocations have been severe in one region or another at various times over the past 50 years, never in that time span has the annual output of the entire global economy contracted. But, as bad as the outcome has been, the decline would likely have been far larger if policymakers in the world's key economies had not acted forcefully to limit the impact of the crisis.

The global economic crisis started as a financial crisis, generally beginning in housing-related asset markets, and accelerated in the fall of 2008. After September 2008, interbank interest rates spiked, exchange rates shifted quickly, and the flows of capital across borders slowed dramatically. Trade flows also plummeted, falling even more dramatically than GDP. As a result, trade flows became a key transmission mechanism in the crisis, spreading macroeconomic distress to countries that were not primarily exposed to the financial shocks.

Policymakers around the world responded quickly, sometimes taking coordinated action, sometimes acting independently. Many central banks

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<sup>1</sup> Quarterly figures are calculations of the Council of Economic Advisers based on a 64-country sample that represents 93 percent of world GDP. Annual average projections are from the International Monetary Fund (2009a). These projections indicate that from the fourth quarter of 2007 to the fourth quarter of 2008, world GDP contracted 0.1 percent, and from the fourth quarter of 2008 to the fourth quarter of 2009, world GDP expanded 0.8 percent. The contraction was strongest from the middle of 2008 to the middle of 2009; hence the annual average growth from 2008 to 2009 (-1.1 percent) is lower than the fourth-quarter-to-fourth-quarter numbers.

cut interest rates nearly to zero and expanded their balance sheets to try to stimulate lending and keep their economies going. They also lent large sums to one another to prevent dislocations caused by a lack of foreign currency in some markets. Beyond the central bank actions, governments intervened more broadly in banks and financial markets as well. Governments also spent large sums in fiscal stimulus to avoid massive drop-offs in aggregate demand. In a welcome development, they did not, however, restrict trade in an attempt to turn away imports.

The global economy is now seeing the beginnings of recovery. Financial markets have rebounded, trade is recovering, and GDP growth rates are again positive. Recovery is far from complete or certain, and some risks remain: lending is still constrained, and unemployment is painfully high. But, at the start of 2010, the world economy is no longer at the edge of collapse, and the elements of a sound recovery seem to be coming into place.

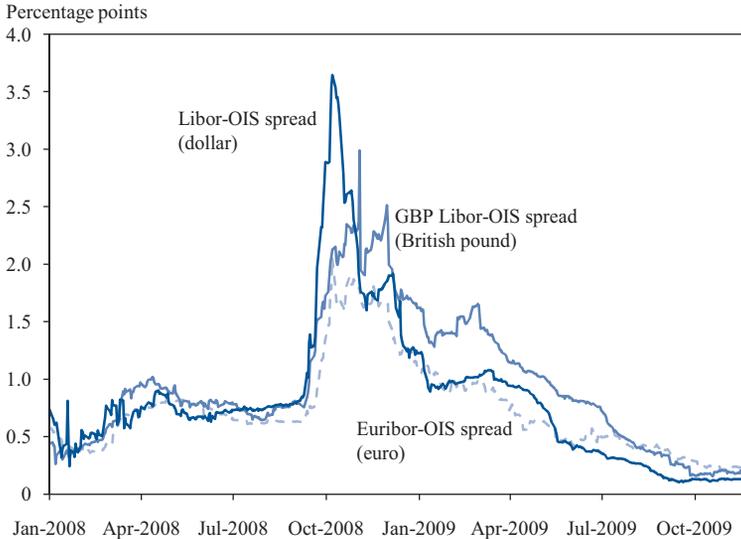
## **INTERNATIONAL DIMENSIONS OF THE CRISIS**

The worldwide contraction had roots in many financial phenomena, and its rapid spread can be seen in a number of financial indicators. Borrowing costs increased, U.S. dollars were scarce in foreign markets, and exchange rates moved rapidly. Yet, despite problems in U.S. financial markets, there was no U.S. dollar crisis, and while currency markets moved rapidly, many of the emerging-market currency depreciations were temporary and not accompanied by cascading defaults. Thus, the world economy was better positioned for recovery than it might have been.

### ***Spread of the Financial Shock***

One of the early indicators of the crisis was the large spike in the interest rate banks charge one another that took place as the value of assets held on bank balance sheets came into question. After the investment bank Lehman Brothers declared bankruptcy in September 2008, banks grew even warier about lending to each other. This fear of lending to one another can be seen by comparing the interbank lending rate with the risk-free overnight interest rate. Similar to the TED spread, the Libor-OIS spread (the London interbank offered rate minus the overnight indexed swap) gives such a comparison for dollar loans, and comparable spreads are available for loans in other currencies. As Figure 3-1 shows, the spike in spreads for dollar loans was larger earlier, but the increase in interbank lending rates was sharp in dollars, pounds, and euros alike. Banks simply refused to lend to one another at low rates in these major financial systems. Furthermore, concerns about which firms might go bankrupt sent the cost of insuring

Figure 3-1  
Interbank Market Rates



Source: Bloomberg.

against a default on a bond soaring. Thus, costs of borrowing increased for even creditworthy borrowers, putting a strain on the ability of firms to finance themselves.

***The Dollar Shortage.*** Beyond the difficulties of evaluating counterparty risk were the acute shortages of dollar liquidity outside the United States, which were reflected in a steep rise in the cost of exchanging foreign currency for dollars for a fixed period of time (a foreign currency swap). The reasons for the dollar shortage are complex but can be understood by looking at foreign banks' behavior before the crisis. During the boom years, non-U.S. banks acquired large amounts of dollar-denominated assets, often paying for these acquisitions with borrowed dollars rather than with their own currency, thus avoiding the currency mismatch risk of borrowing in one currency and having assets in another. Much of the dollar borrowing was short term and came from U.S. money-market funds. After investors began to pull their money out of these funds in the fall of 2008, that source of lending dried up, and banks were left trying to obtain dollars in other ways. This put pressure on the currency swap market.

Before the crisis, moreover, some banks funded purchases of U.S. assets directly through swaps. In a simplified version of the transaction, foreign banks borrow in their own currency (euros, for example), exchange that currency for dollars through a swap, and then use the dollars to buy U.S. assets. By using a swap market rather than simply purchasing currency, they

even out the currency risk (McGuire and von Peter 2009),<sup>2</sup> but they are left with a funding risk. If no one will lend them dollars when their swap is due, they may have to sell their dollar assets (some of which may have fallen in value) to pay back the dollars they owe. When banks became very nervous about taking on risk, demand greatly increased the price of currency swaps.

***Unwinding Carry Trades.*** As concerns about the stability of the financial markets heightened over the course of 2008, investors responded by trying to deleverage and reduce some of their exposed risky positions. The desire to undo risky positions coupled with the dollar shortage led to swift movements in currency markets, especially an unwinding of the “carry trade.” In the carry trade, an investor borrows money in a low-interest-rate currency (for example, the Japanese yen), sells that currency for a higher-interest-rate currency (for example, the Australian dollar), and invests the money in that currency. If interest rates are 1 percent in Japan and 6 percent in Australia, the investor stands to collect a 5 percent profit if exchange rates do not move. Although economic theory suggests that currency movements should offset this expected profit, over short horizons, if the exchange rate does not move, investors can make a profit. This happened in the mid-2000s, and the carry trade became a favorite strategy for hedge funds and other investors.

The popularity of the trade became self-fulfilling as the continued flows of money into higher-interest-rate currencies helped them appreciate and made the trade even more profitable. But, as the crisis hit, investors tried to reduce their risk and leverage. This unwinding process meant rapid sales of high-interest-rate currencies and rapid purchases of low-interest-rate currencies. Currencies that had low interest rates and had been known as funding currencies (such as the Japanese yen) rose rapidly in value, and the currencies of a number of popular carry-trade destinations (such as Australia, Brazil, and Iceland) depreciated swiftly. Thus, as the crisis hit, borrowing became more expensive and currency markets were increasingly volatile.

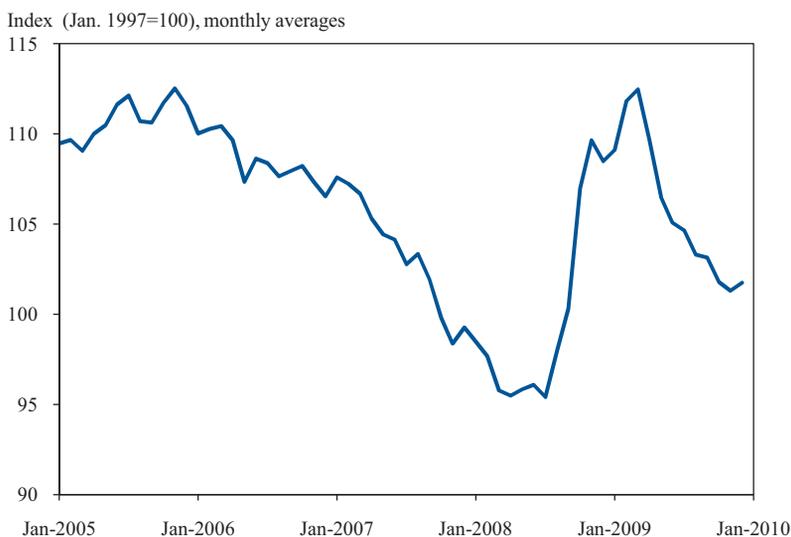
***The Dollar During the Crisis.*** Although in many ways the crisis was triggered within U.S. asset markets, the response was not a run on the U.S. dollar; instead the dollar strengthened notably. Some observers had argued that the high U.S. current account deficit and problems in the U.S. housing and other asset markets might lead to an unwillingness to hold U.S. assets more broadly, which could have triggered a depreciation of the dollar. But both the need for foreign banks to cover their dollar borrowing and the need for other investors to repay loans borrowed in dollars (including for carry trades) generated strong demand for dollars. Further, the desire to

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<sup>2</sup> The swap means they have borrowed dollars and lent euros. In this way, they borrowed euros at home and lent them in the swap, and they owe dollars in the swap but also own dollar assets. Thus, their foreign currency position is balanced.

avoid risky investments at the height of the crisis led to a “flight to safety,” with many investors buying dollars and U.S. Treasury bills. As seen in Figure 3-2, the trade-weighted value of the dollar increased 18 percent from July 2008 to its peak in March 2009. The movement of the dollar was broad-based, with sharp appreciations against most major trade partners; the main exceptions were Japan, where the yen appreciated even more against the world as the carry trade unwound, and China, which had reestablished its peg to the dollar in July of 2008 and therefore had a stable exchange rate against the dollar.

Figure 3-2  
Nominal Trade-Weighted Dollar Index



Note: The index is constructed such that an upward movement represents an appreciation of the dollar.

Source: Federal Reserve Board, G.5.

**Currency Volatility in Emerging Markets.** The deleveraging and fall in risk appetite contributed to large and in some cases sharp swings in the currencies of many emerging economies, but the impact of these large depreciations varied. Some of the sharpest depreciations, such as those in Brazil, Korea, and Mexico, were largely temporary. The currencies of all three countries depreciated more than 50 percent against the dollar between the end of July 2008 and February 2009, but by the end of November 2009 Korea’s currency was down only 15 percent and Brazil’s only 12 percent. Mexico was still 29 percent below its summer 2008 value.<sup>3</sup>

<sup>3</sup> The starting point for comparison is important. Korea had been depreciating in early 2008 as well, while Brazil and Mexico were appreciating. Thus, by the end of November 2009, Brazil had appreciated slightly from the start of 2008 while Korea had depreciated 24 percent and Mexico 18 percent.

Some countries with large current account deficits faced more pressure. The region with the sharpest declines in the value of its currencies against the dollar was Eastern Europe, where the currencies of Hungary, Poland, and Ukraine all depreciated more than 50 percent between July 2008 and February 2009, and others depreciated nearly as much. These large depreciations resulted in part from the strengthening of the dollar against the euro, as many of these countries are closely tied with Europe, but some of these currencies remained weak even when other countries started to strengthen against the dollar.

A large depreciation can especially lead to broad damage in an economy if there are negative balance-sheet effects. In this setting, a country may have few foreign assets but extensive liabilities denominated in foreign currency. As the exchange rate depreciates, the foreign currency loans become more expensive in local currency. This was particularly a concern in Eastern Europe, where many countries borrowed substantially in foreign currency leading up to the crisis. In Hungary, for example, many individuals took out mortgages in foreign currency. The depreciation of the Hungarian *forint* thus put pressure on both individuals and bank balance sheets. There was widespread concern that the Western European banks, such as those in Austria, that had made loans in Eastern Europe would face substantial losses. Both the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF) warned of potentially serious bank problems in Austria because of these concerns. By the end of 2009, however, those concerns had not materialized. Austria has had to shore up its banks, but there has not been widespread contagion from Eastern Europe.

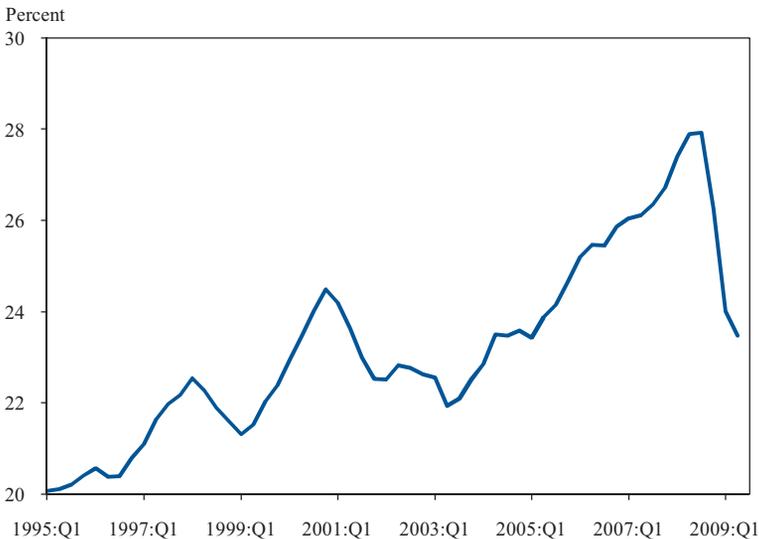
During the peak of the crisis, the spreads on emerging-market bonds spiked, but they returned toward more standard levels over time, and outright financial collapse was avoided. There are a number of reasons for the more contained impact of the exchange-rate movements during the crisis. In the past decade, many developing countries have reduced the currency mismatch on their balance sheets by borrowing less, increasing their stocks of foreign exchange reserves, and shifting away from debt finance (Lane and Shambaugh forthcoming). The improved fiscal positions of some countries likely also helped, as did the strong policy response and coordination described later. Some vulnerable countries also benefited from the strengthening of the IMF's lending capabilities (discussed later). The failure of this shock to turn into a series of deep sustained financial collapses across the emerging world was a welcome development that left the world economy better positioned for a quick turnaround.

## *The Collapse of World Trade*

Despite this crisis's origins in the financial sector, trade rapidly became a crucial source of transmission of the crisis around the world. Exports collapsed in nearly every major trading country, and total world trade fell faster than it did during the Great Depression or any time since. From a peak in July 2008 to the low in February 2009, the nominal value of world goods exports fell 36 percent; the nominal value of U.S. goods exports fell 28 percent (imports fell 38 percent) over the same period. Even countries such as Germany, which did not experience their own housing bubble, experienced substantial trade contractions, which helped spread the crisis. The collapse in net exports in Germany and Japan contributed substantially to their declines in GDP, helping drive these countries into recession. In the fourth quarter of 2008, Germany's drop in net exports contributed 8.1 percentage points to a 9.4 percent decline in GDP (at an annual rate); Japan's net exports contributed 9.0 percentage points to a 10.2 percent GDP decline. Real exports fell even faster in the first quarter of 2009.

Figure 3-3 shows that the drop in the trade-to-GDP ratio during this crisis, from 28 percent to 23 percent in OECD countries, is unprecedented. Trade as a share of GDP had not dropped by more than 2 percentage points from the year before since at least 1970 (the earliest available data), suggesting trade's drop relative to GDP has been larger than in the past. Economists have noted that the responsiveness of trade to GDP has been

Figure 3-3  
OECD Exports-to-GDP Ratio

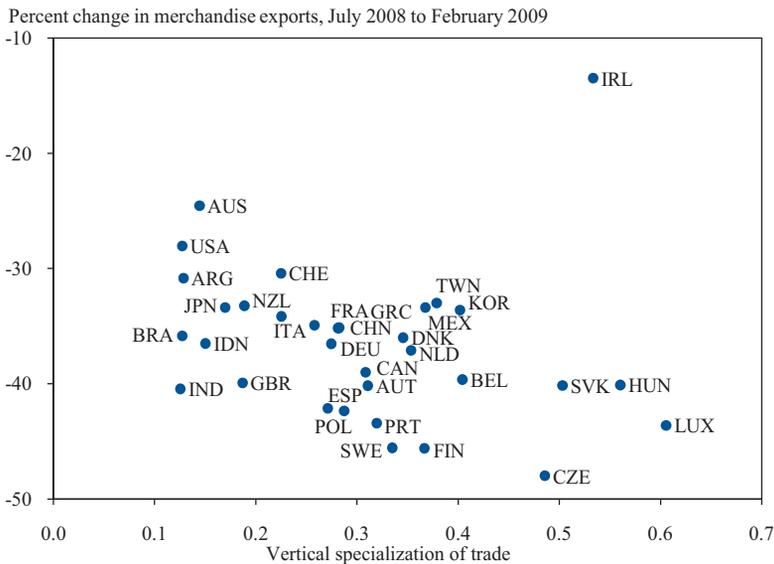


Source: Organisation for Economic Co-operation and Development, Quarterly National Accounts.

rising over time. Three main reasons for the exceptionally large fall in trade, even given the decline in GDP, have been suggested (Freund 2009; Levchenko, Lewis, and Tesar 2009; and Baldwin 2009).

The first reason is the use of global supply chains (or vertical specialization), where parts of production are manufactured or assembled in different countries and intermediate inputs are shipped from country to country, often from one branch of a firm to another, and then sent to a final destination for finishing. In this case, a reduction in output of one car may involve a decrease in shipments far larger than the final value of that single car. For example, a country that imports \$80 of inputs and adds \$20 of value added before exporting a \$100 good will see GDP fall by \$20 if demand for that good disappears, but trade (measured as the average of imports and exports) will fall \$90. If the decline in demand was concentrated in goods where global supply chains were particularly important, this could help account for the large fall in trade-to-GDP ratios. Estimates are that imported inputs account for, on average, 30 percent of the content of exports in OECD and major emerging market countries, although there is variation across countries within the OECD. Figure 3-4 shows that, with the exception of Ireland, the percentage by which trade declined for a country was

Figure 3-4  
Vertical Specialization and the Collapse in Trade



Notes: See text for definition of the vertical specialization of trade. Merchandise exports measured in dollars. Alternate data from Johnson and Noguera (2009), which include the degree to which exports themselves are intermediate inputs, show a similar picture. Sources: Miroudot and Ragoussis (2009); country sources; CEA calculations.

strongly correlated with the extent of that country's vertical specialization (specifically defined as the degree of imported inputs used in exports).

Second, the disruption in global financial markets may have helped generate the trade collapse. Exporters typically require some form of financing to produce their export goods because importers will not pay for them before they arrive. Similarly, importers may need some sort of financing to bridge the gap between when they need to pay for goods and when they will be able to sell them on a domestic market. When liquidity tightened in world financial markets, the cost of trade finance increased. Little high-quality information is available for trade finance because it is typically arranged by banks or from one party to another, rather than through an organized exchange. The data that do exist show a drop in trade finance, but one that is not necessarily larger than the drop in overall trade. The drop in general financing available for producers and consumers, along with the impact of the recession on aggregate demand, may be factors as significant as the specifics of trade finance.<sup>4</sup>

Finally, the types of products that are traded may have been a critical factor in the trade collapse. Investment goods and consumer durables make up a substantial portion of merchandise trade, representing 57 percent of U.S. exports and 49 percent of U.S. imports in 2006. In a recession, investment spending by firms and purchases of durable goods by consumers often fall more sharply than other components of GDP. Because these investment and purchasing decisions are large and irreversible, they may be delayed until the economic situation is more clear. The drop in spending in these categories during this crisis has been far more severe than in previous recessions in the past 30 years in the United States. Paralleling the movements in overall demand, the collapse in the nominal value of trade was most severe in capital and durable goods and in chemicals and metals, and least severe in services and nondurable goods. The combination of the concentration of the spending reduction in these sectors and the sectors' importance in overall trade appears to be one source of the sharp fall in trade in the crisis.

### *The Collapse in Financial Flows*

Trade in goods was not the only international flow to collapse. Financial trade evaporated in a way never before seen. U.S. outflows and inflows of finance rose steadily for decades as increasingly integrated capital markets grew in size and scope. By 2007, the average monthly gross purchases and sales of foreign long-term assets by American investors were

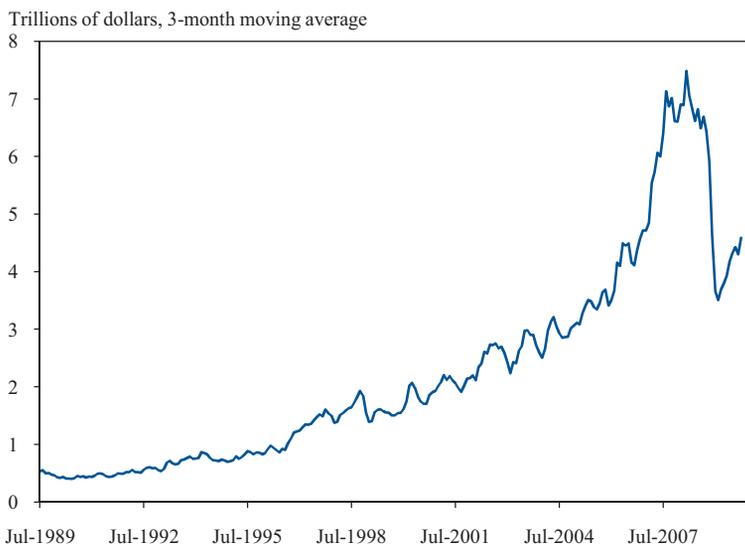
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<sup>4</sup> See Mora and Powers (2009) for a discussion of trade finance in the recent crisis. Levchenko, Lewis, and Tesar (2009) find no support for the notion that trade credit played a role in the reduced trade flows for the United States during the crisis.

\$1.4 trillion, and foreigners' purchases and sales of U.S. long-term assets were \$4.9 trillion. Each group both bought and sold a considerable amount of their holdings, so that net purchases by Americans were \$19 billion a month and net purchases by foreign investors were \$84 billion a month.

When the crisis hit, there was a massive deglobalization of finance that was unprecedented and in many ways more extreme than the collapse in goods and services trade. Figure 3-5 shows that the scale of cross-border flows was cut in half after years of fairly steady climbing. Net purchases by both home and foreign investors actually became negative in the fall of 2008 (that is, there were more sales than purchases). Americans pulled funds home at such a fast pace that from July to November of 2008, Americans on net sold foreign assets worth \$143 billion. Foreign investors also liquidated their positions, selling a net \$92 billion in U.S. holdings. Hence, outflows from foreign investors returning to their home markets were offset in part by inflows from Americans bringing money back to the United States, likely reducing the impact of the outflows.

Figure 3-5  
Cross-Border Gross Purchases and Sales of Long-Term Assets



Source: Department of the Treasury (Treasury International Capital System).

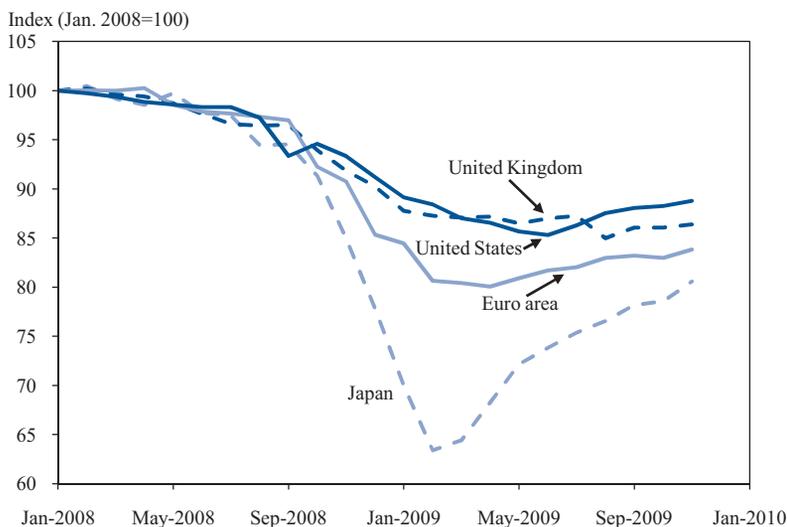
### ***The Decline in Output Around the Globe***

While the triggers of the crisis are generally considered financial in nature, these shocks were rapidly transmitted to the real economy. What had been a financial market shock or a trade collapse became a full-fledged recession in countries around the world. The financial disruption was so

strong and swift in most countries that confidence fell as well. Confidence levels are measured in different ways across countries, but they were generally falling throughout 2008 and reached recent lows in the fall of 2008 and winter of 2009. In many countries, confidence had not been so low in more than a decade.

As noted, world GDP is estimated to have fallen roughly 1.1 percent in 2009 from the year before. The number for the annual average masks the shocking depth of the crisis in the winter of 2008–09, when GDP was contracting at an annual rate over 6 percent. In advanced economies, the crisis was even deeper; the IMF expects GDP to have contracted 3.4 percent in advanced economies for all of 2009. For OECD member countries, GDP fell at an annual rate of 7.2 percent in the fourth quarter of 2008 and 8.4 percent in the first quarter of 2009. Despite the historic nature of its collapse, the U.S. economy actually fared better than about half of OECD economies during those quarters. Figure 3-6 shows the decline in industrial production across major economies, with each of these economies in January 2009 more than 10 percent below its January 2008 level, and Japan faring far worse relative to the other major economies.

Figure 3-6  
Industrial Production in Advanced Economies

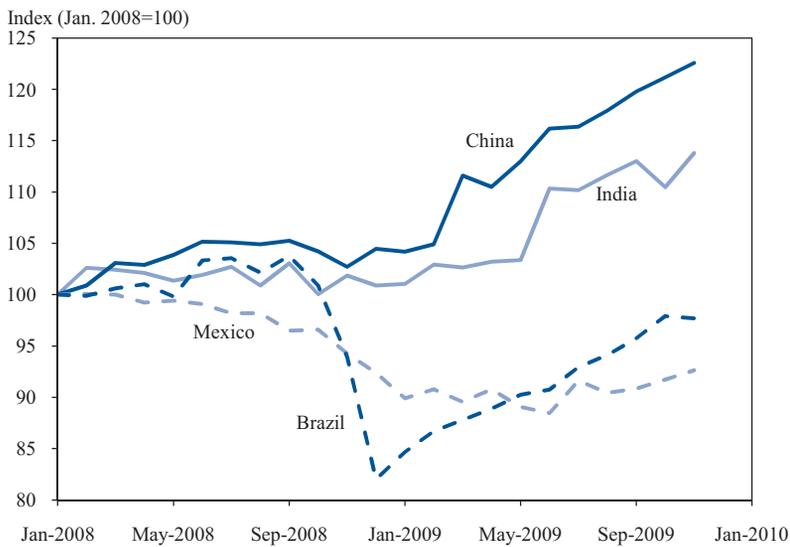


Sources: Country sources.

Some emerging market countries collapsed as well, with contractions at an annual rate of over 20 percent in Mexico, Russia, and Turkey, but the collapses were brief—lasting only a quarter or so. On average, the emerging and developing world was quite resilient to the crisis and is

projected to have continued to expand in 2009 at a rate of 1.7 percent for the year (these countries contracted in the first quarter, but they began growing quickly in the second quarter). Some regions, such as developing Asia, continued to grow at a robust pace for the year as a whole (over 6 percent), but even that rate is considerably slower than their growth in the mid-2000s. Figure 3-7 shows that industrial production fell in Brazil and Mexico in a manner similar to that in industrial economies, but in China and India it merely stalled for a brief period and then accelerated again. This overall performance in the emerging world is a turnaround from previous crises, where recessions in the advanced countries were followed by sustained collapses in some emerging countries.

Figure 3-7  
Industrial Production in Emerging Economies

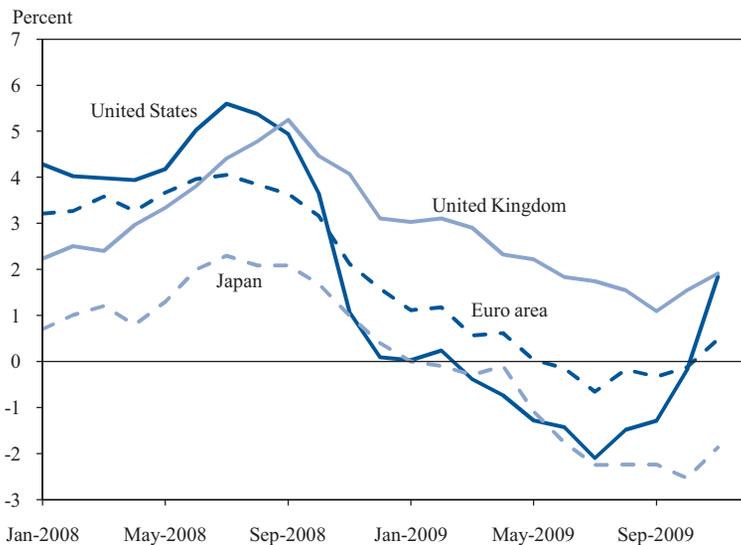


Sources: Country sources.

The combination of weak aggregate demand and falling energy prices has meant that price pressure has been starkly absent in this crisis. In fact, lower oil prices have meant that year-over-year inflation numbers were negative in most major countries until toward the end of 2009 (Figure 3-8). Core inflation rates—which exclude volatile energy and food prices—have also been quite low over the year and even negative in Japan. This lack of price pressure has left the world’s central banks with more flexibility than they had in the 1970s recessions because they do not have pressing inflation problems to consider. Inflation has also been muted in emerging and developing countries relative to their history; it is estimated

to be 5.5 percent over 2009 and is projected to fall slightly in 2010. As economies and commodity markets strengthened toward the end of 2009, inflation pressure grew in a limited number of countries but was not in any way widespread.

Figure 3-8  
Headline Inflation, 12-Month Change



Sources: Country sources.

## POLICY RESPONSES AROUND THE GLOBE

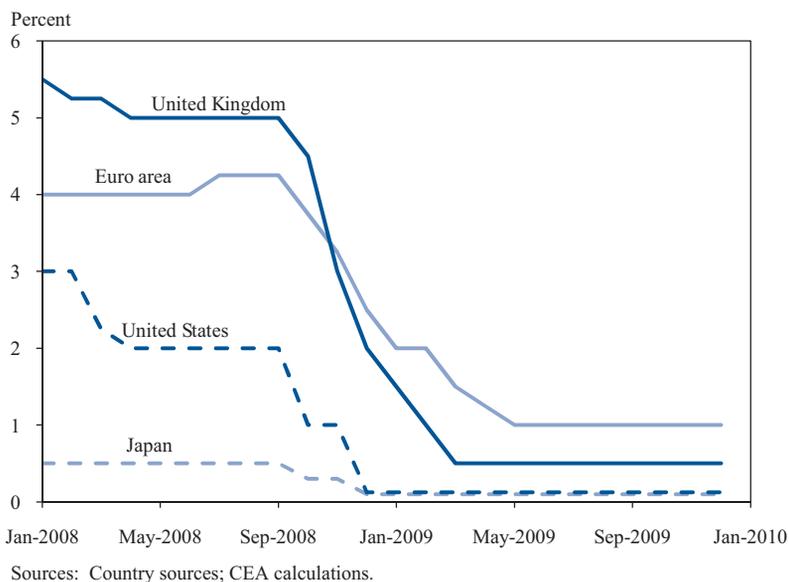
Given the severity of the downturn, it is not surprising that policymakers responded with dramatic action. Central banks cut interest rates, governments spent considerable sums in the form of fiscal stimulus, and governments and central banks supported financial sectors with funds and guarantees. Many of these actions were coordinated as policymakers tried to prevent the financial market upheaval and recession from becoming a full-fledged depression.

### *Monetary Policy in the Crisis*

The response of monetary authorities was both strong and swift across the globe. The major central banks coordinated a significant rate cut of 50 basis points on October 8, 2008, in an attempt to increase liquidity and to boost confidence by demonstrating that they were prepared to act decisively. During the crisis, every member of the Group of Twenty (G-20)

major economies cut interest rates. By March 2009, the Federal Reserve, the Bank of Japan, and the Bank of England had all cut rates to 0.5 percent or less, with the Federal Reserve and the Bank of Japan approaching the zero nominal lower bound. The European Central Bank (ECB) responded slightly more slowly but still cut its policy rate more than 3 percentage points to 1 percent by May 2009 (Figure 3-9). Emerging market countries and major commodity exporters, whose economies were growing fast in the summer of 2008, moved as well, but not to the near-zero levels seen at the major central banks.

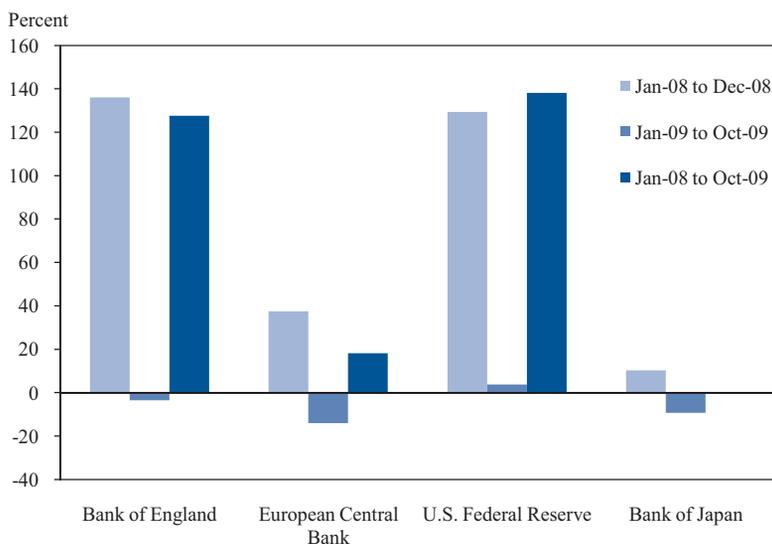
Figure 3-9  
Policy Rates in Economies with Major Central Banks



Besides cutting interest rates, three of the largest central banks used nonstandard monetary policy as well. As Figure 3-10 shows, the Federal Reserve and the Bank of England more than doubled the size of their balance sheets in 2008 (see Chapter 2 for more details on the Federal Reserve’s actions). The two banks bought large quantities of assets, substantially increasing the supply of reserves, and made loans against a variety of asset classes. The goal of these programs was to free up credit in markets that were being underserved through purchases of, or loans against, asset-backed securities and commercial paper. The ECB also expanded its balance sheet substantially (37 percent) in 2008 and made loans against a variety of assets, but it did not undertake the same level of quantitative easing as either the U.S. or U.K. central banks. The Bank of Japan did not expand its balance

sheet on a similar scale.<sup>5</sup> While it did expand some of its lending programs in corporate bond markets, its policies were more oriented to financial markets than to quantitative monetary policy. As noted earlier, Japan's inflation rate has been negative.

Figure 3-10  
Change in Central Bank Assets



Sources: Country sources; CEA calculations.

As Figure 3-10 shows, the rapid growth of central bank balance sheets halted during 2009, but the central banks have not withdrawn the liquidity they injected into the system. Similarly, policy interest rates have remained constant since December 2008 in the United States and Japan and since the spring of 2009 in the euro area and the United Kingdom. Some commodity producers and smaller advanced nations with strong growth have begun to withdraw some monetary accommodation. Australia, Israel, and Norway have all raised policy interest rates. Also, authorities in countries such as China and India had not raised main policy rates as of the end of 2009, but they have made administrative changes that tightened lending to slow the expansion of credit as their economies began to grow more quickly.

In addition to lending support, authorities directly intervened to support the banking sectors in a number of countries. Countries took many actions on their own, ranging from the policies pursued in the United States such as the Troubled Asset Relief Program (discussed in Chapter 2), to direct takeovers of some banks in the United Kingdom, to the creation of other

<sup>5</sup> On December 1, 2009, the Bank of Japan announced a roughly \$115 billion increase in lending, equivalent to a nearly 10 percent increase in its balance sheet. This increase was significant but still far below the actions taken by other major central banks.

entities to centralize some bad assets and clean the balance sheets of other banks in Switzerland and Ireland, to general support and guarantees in a wide range of countries.

### ***Central Bank Liquidity Swaps***

In addition to the coordination of rate cuts, one other important form of international coordination took place across central banks. As noted, a dollar funding shortage materialized abroad, as the normal channels for the transmission of dollar liquidity from U.S. markets to the global financial system broke down. This shortage presented a unique set of challenges to central banks. They could have simply provided domestic currency and left banks to sell it for dollars, but the foreign exchange swaps market in which such transactions are usually conducted was severely impaired. Alternatively, central banks could have used dollar reserves to provide foreign currency funds, but few advanced countries (outside of Japan) had sufficient foreign currency holdings to fully address the foreign currency funding needs of their banking systems.

Central banks whose currencies were in demand responded to the shortage by providing large amounts of liquidity to partner central banks through central bank liquidity swaps.<sup>6</sup> In many of these arrangements, the Federal Reserve purchased foreign currency in exchange for U.S. dollars and at the same time agreed to return the foreign currency for the same quantity of dollars at a specific date in the future. When foreign central banks drew dollars in this way to fund their auctions of dollar liquidity in local markets, the Federal Reserve received interest equal to what the foreign central banks were receiving on the lending operations. The Federal Reserve first used these swaps in late 2007 on a relatively small scale. But, as shown in Figure 3-11, from August 2008 through December 2008 these swaps increased from \$67 billion to \$553 billion. This massive supply of liquidity was larger than the available lending facilities of the IMF. The United States extended this program to major emerging market countries as well on October 29, 2008, providing lines of up to \$30 billion each to Brazil, Mexico, Singapore, and Korea.

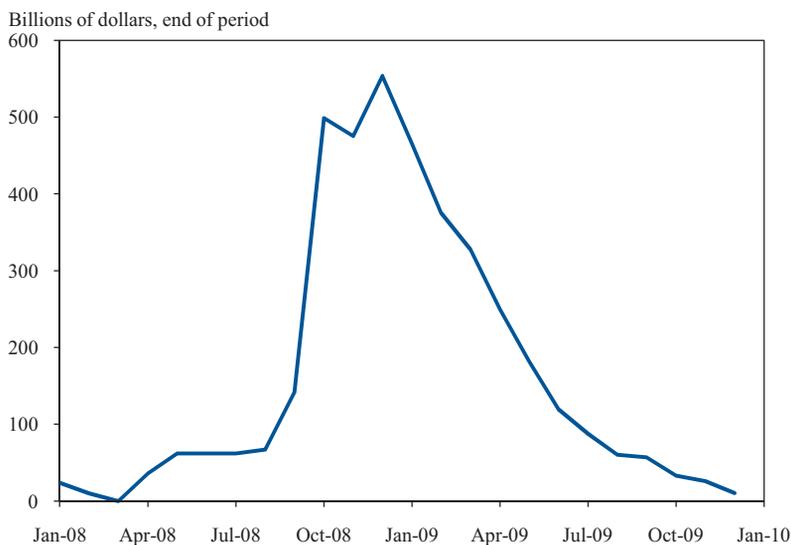
As the acute funding needs have subsided, nearly all of the central bank swaps have been unwound, and the Federal Reserve has announced that it anticipates that these swap arrangements will be closed by February 1, 2010. There was no long-term funding cost to the Federal Reserve from these swap lines; moreover, the Federal Reserve's counterparties in these transactions were the central banks of other countries, and the loans

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<sup>6</sup> See Fender and Gyntelberg (2008) for a more comprehensive discussion.

were fully collateralized with foreign currency, so very little credit risk was involved in these transactions.

Figure 3-11  
Central Bank Liquidity Swaps of the Federal Reserve



Source: Federal Reserve Board, Factors Affecting Reserve Balances of Depository Institutions and Condition Statements of Federal Reserve Banks, H.4.1 Table 1.

Although the dollar funding shortages were unique, the Federal Reserve was not the only central bank to provide swap lines. Some of the more notable examples include the European Central Bank, which made euros available to a number of central banks in Europe, among them the central banks of Denmark, Hungary, and Poland, that felt pressure for funding in euros; the Swedish central bank, which provided support to central banks in the Baltics; and the Swiss National Bank, which provided Swiss francs to the European Central Bank and Poland. Across Asia there was renewed interest in the Chiang Mai Initiative, under which various Asian central banks set up swap lines that could be used in an emergency. Despite the increases in these cross-Asian country swap lines, together they totaled \$90 billion, far less than the available Federal Reserve swap lines, and they were not drawn on during the crisis. In sum, while existing institutional structures (IMF lending or reserves) appear to have been insufficient to meet this aspect of the crisis, the world's central banks innovated to take temporary actions that quelled market disruptions and avoided even sharper financial dislocation.

## *Fiscal Policy in the Crisis*

In part because major central banks had pushed interest rates as low as they could go and in part because of the magnitude of the crisis, by the beginning of 2009, many countries decided to institute substantial fiscal stimulus. The hope was that government spending could step into the breach left by the collapse of private demand and provide the necessary lift to prevent a slide into a deep recession or worse.

Nearly every major country instituted stimulus, with the exception of some countries hampered by substantial public finance concerns, such as Hungary and Ireland. Every G-20 nation implemented substantial stimulus, with an unweighted average of 2.0 percent of GDP in 2009 (Table 3-1), and many other OECD nations also adopted stimulus plans. Among G-20 countries, China, Korea, Russia, and Saudi Arabia enacted the most extensive stimulus programs in 2009, all equivalent to more than 3 percent of GDP. The U.S. stimulus in 2009 (estimated at 2 percent of GDP) was greater than the OECD's estimate of its member country average (1.6 percent of GDP), but the same as the G-20 average and not quite as extensive as the four high-stimulus nations.

Table 3-1  
2009 Fiscal Stimulus as Share of GDP, G-20 Members

Argentina	1.5%	Japan	2.9%
Australia	2.9%	Mexico	1.6%
Brazil	0.6%	Russia	4.1%
Canada	1.8%	Saudi Arabia	3.3%
China	3.1%	South Africa	3.0%
France	0.6%	South Korea	3.7%
Germany	1.6%	Turkey	2.0%
India	0.6%	United Kingdom	1.6%
Indonesia	1.4%	United States	2.0%
Italy	0.1%	<b>All G-20 Nations</b>	<b>2.0%</b>

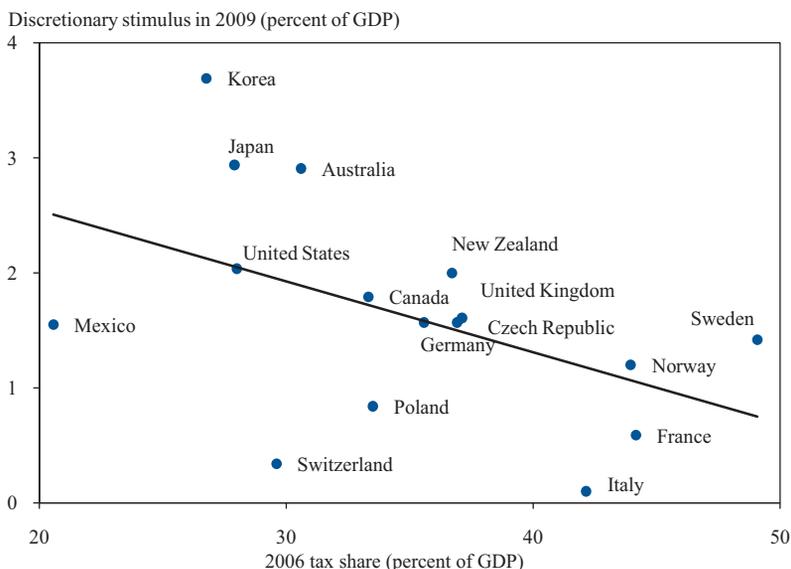
Note: Values are average of International Monetary Fund and Organisation for Economic Co-operation and Development estimates for nations with expansionary fiscal policies.

Sources: Horton, Kumar, and Mauro (2009); Organisation for Economic Co-operation and Development (2009a).

Discretionary fiscal action was not the only form of fiscal stimulus; automatic stabilizers (unemployment insurance, welfare, reduction in taxes collected due to lower payrolls) are triggered when an economy slows down. The size of automatic stabilizers present in an economy appears to be negatively correlated with the size of discretionary stimulus. As Figure 3-12 shows, those countries that already had large automatic stabilizers in place

appear to have adopted less discretionary fiscal stimulus, but they were obviously still providing substantial fiscal relief during the crisis.<sup>7</sup>

Figure 3-12  
Tax Share and Discretionary Stimulus



Notes: The regression line is  $\text{stimulus} = 3.8 - 0.06 * (\text{tax share})$ . The coefficient on tax share is significant at the 90 percent confidence level. The R-squared is 0.23.

Sources: Organisation for Economic Co-operation and Development, Tax Database Table O.1; Organisation for Economic Co-operation and Development (2009a); Horton, Kumar, and Mauro (2009).

Stimulus is expected to fade slowly in 2010. Overall, the IMF estimates that advanced G-20 countries will spend 1.6 percent of GDP on discretionary stimulus in 2010, compared with 1.9 percent in 2009.<sup>8</sup> Emerging and developing G-20 countries will also spend 1.6 percent of GDP in 2010, compared with 2.2 percent in 2009. The IMF projects that among the G-20 countries that adopted large stimulus programs, only Germany, Korea, and Saudi Arabia will increase those programs in 2010. In addition, substantial stimulus will continue into 2010 in Australia, Canada, China, and the United

<sup>7</sup> The level of taxation in the economy is used as a proxy for automatic stabilizers. Countries with large levels of taxation see immediate automatic stabilizers because any lost income immediately reduces taxes. Those same countries often tend to have more generous social safety nets (funded by their higher taxes).

<sup>8</sup> The averages are calculated by the IMF using PPP GDP weights. That is, the IMF uses the size of an economy—evaluated at purchasing power parity exchange rates, which take into account different prices for different types of goods and services—to weight the different countries in the averages.

States.<sup>9</sup> Thus, substantial fiscal stimulus should continue to support the recovering world economy. The crucial question will be whether sufficient private demand has been rekindled by late 2010 to pick up the economic slack as stimulus unwinds.

### *Trade Policy in the Crisis*

An extremely welcome development is the policy that was not called on during the crisis: trade protectionism. Frequently viewed as an accelerant of the Great Depression, protectionism has been largely absent during the current crisis. In the Great Depression, trade protectionism came into play after the crisis had started and was not a cause of the Depression itself (Eichengreen and Irwin 2009). But the extensive barriers that built up in the first few years of the Depression meant that as production rebounded, trade levels could not do so. In the current crisis, rather than respond to declining exports with increasing tariffs, countries left markets open, allowing for the possibility of a rebound in world trade. No major country has instituted dramatic trade restrictions. Furthermore, while antidumping and countervailing duty investigations have increased, the value of imports facing possible new import restrictions by G-20 countries stemming from new trade remedy investigations begun between 2008:Q1 and 2009:Q1 represents less than 0.5 percent of those countries' imports (Bown forthcoming).

## **THE ROLE OF INTERNATIONAL INSTITUTIONS**

Rather than resort to beggar-thy-neighbor policies, this crisis has been characterized by international policy coordination. National policies did not take place in a vacuum; to the contrary, nations used a number of international institutions to coordinate and communicate their rescue efforts.

### *The G-20*

The G-20, which includes 19 nations plus the European Union, was the locus of much of the coordination on trade policy, financial policy, and crisis response. Its membership is composed of most of the world's largest economies—both advanced and emerging—and makes up nearly 90 percent of world gross national product.

The first G-20 leaders' summit was held at the peak of the crisis in November 2008. At that point, G-20 countries committed to keep their markets open, adopt policies to support the global economy, and stabilize the financial sector. Leaders also began discussing financial reforms that would help prevent a repeat of the crisis.

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<sup>9</sup> Japan has announced additional stimulus since these estimates and will also be providing extensive stimulus in 2010.

The second G-20 leaders' summit took place in April 2009 at the height of concern about rapid falls in GDP and trade. Leaders of the world's largest economies pledged to "do everything necessary to ensure recovery, to repair our financial systems and to maintain the global flow of capital." Furthermore, they committed to work together on tax and financial policies. Perhaps the most notable act of world coordination was the decision to provide substantial new funding to the IMF. U.S. leadership helped secure a commitment by the G-20 leaders to provide over \$800 billion to fund multi-lateral banks broadly, with over \$500 billion of those funds allocated to the IMF in particular.

In September 2009, the G-20 leaders met in Pittsburgh. They noted that international cooperation and national action had been critical in arresting the crisis and putting the world's economies on the path toward recovery. They also recognized that continued action was necessary, pledged to "sustain our strong policy response until a durable recovery is secured," and committed to avoid premature withdrawal of stimulus. The leaders also focused on the policies, regulations, and reforms that would be needed to ensure a strong recovery while avoiding the practices and vulnerabilities that gave rise to boom-bust cycles and the current crisis. They launched a new Framework for Strong, Sustainable, and Balanced Growth that committed the G-20 countries to work together to assess how their policies fit together and evaluate whether they were "collectively consistent with more sustainable and balanced growth." Further, the leaders committed to act together to improve the global financial system through financial regulatory reforms and actions to increase capital in the system.

Given the central role the G-20 had played in the response to the crisis, it is not surprising that the leaders agreed in Pittsburgh to make the G-20 the premier forum for their economic coordination. This shift reflects the growing importance of key emerging economies such as India and China—a shift that was reinforced by the agreement in Pittsburgh to realign quota shares and voting weights in the IMF and World Bank to better reflect shifts in the global economy.

### ***The International Monetary Fund***

The IMF's role has changed considerably over time, from being the shepherd of the world's Bretton Woods fixed exchange rate system to becoming a crisis manager. In a systemic bank run, a central bank sometimes steps in as the lender of last resort. The IMF is not a central bank and can neither print money nor regulate countries' behavior in advance of a crisis, but it has played a coordinating and funding role in many crises. As the scale of the current crisis became apparent, it was clear that the IMF's

funds were insufficient to backstop a large systemic crisis, particularly in advanced nations. While it is still unlikely to be able to arrest a run on major advanced country financial systems, the increase in resources stemming from the G-20 summit has roughly tripled the resources available to the IMF and left it better suited to quell runs in individual countries.

As the IMF's resources were expanded, the institution took a number of concrete interventions. It set up emergency lines of credit (called Flexible Credit Lines) with Colombia, Mexico, and Poland, which in total are worth over \$80 billion. These lines were intended to provide immediate liquidity in the event of a run by investors, but also to signal to the markets that funds were available, making a run less likely. Now, rather than have to go to the IMF for funds during a crisis, these countries are "pre-approved" for loans. In each of these countries, markets responded positively to the announcement of the credit lines, with the cost of insuring the countries' bonds narrowing (International Monetary Fund 2009b). The IMF also negotiated a set of standby agreements with 15 countries, committing a total of \$75 billion to help them survive the economic crisis by smoothing current account adjustments and mitigating liquidity pressures. IMF analysis suggests that this program discouraged large exchange-rate swings in these countries (International Monetary Fund 2009b). These actions as well as the very existence of a better-funded global lender may have helped to keep the contraction short and to prevent sustained currency crises in many emerging nations.

## THE BEGINNING OF RECOVERY AROUND THE GLOBE

In contrast to the Great Depression, where poor policy actions—monetary, fiscal, regulatory, and protectionist—helped turn a sharp global downturn into the worst worldwide collapse the modern economy has known, the recent massive policy response helped stop the spiraling of this Great Recession. Already financial markets have stabilized, GDP has begun to grow, and trade has begun to rebound. The crisis is far from over, however; most notably, employment in many countries is still distressingly weak. But the world economy appears to have avoided the outright collapse that was feared at one point and is now moving toward recovery.

The second quarter of 2009 saw the first hints of recovery in many countries. World average growth was 2.4 percent, and even OECD countries registered a positive 0.2 percent growth rate.<sup>10</sup> The rebound caught many by surprise. The IMF and the OECD had revised projections steadily

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<sup>10</sup> World weighted average quarterly real GDP growth rates at a seasonally adjusted annual rate are from CEA calculations. The OECD growth rate is from the OECD quarterly national accounts database.

downward through the winter and spring, but by the middle of 2009 many economies had returned to growth. The one-quarter improvement in annualized growth of 5.7 percentage points (from -6.4 percent to -0.7 percent from the first to the second quarter of 2009) in the United States was one of the largest improvements in decades, but other countries that had deeper contractions rebounded even more. Annualized growth rates improved more than 14 percentage points in Germany and Japan, while growth rates rose more than 30 percentage points in Malaysia, Singapore, Taiwan, and Turkey. Other emerging markets, such as China, India, and Indonesia, which did not contract but faced lower growth during the crisis, rebounded to growth rates on par with their performance during the 2000s (if not the rapid booms of 2006–07).

Trade had collapsed quickly, and it has begun to rebound quickly as well. Beginning in March, when GDP was still falling rapidly, exports began to turn. From lows in February 2009, nominal world goods exports in dollar terms had grown 20 percent by October. U.S. nominal goods exports picked up later but had grown 17 percent from their April lows by October. As GDP began to rise, trade volume began to grow faster. Annualized growth for world real exports was 2.4 percent in the second quarter of 2009 and 16.8 percent in the third quarter. By comparison, world weighted average annualized real GDP growth in the second and third quarters of 2009 was 2.4 percent and 3.4 percent, respectively.

Financial markets are rebounding as well. Net cross-border financial flows are near their pre-crisis levels, and gross flows are increasing (although as of October 2009 they were still less than 80 percent of their average level in 2008). Libor-OIS spreads have fallen to more typical levels, and equivalent measures in other markets have subsided as well. Stock market indexes in the United States, Japan, the United Kingdom, and the European Union have all risen substantially. By October 2009, all were above their levels in October 2008, making up dramatic losses in early 2009. House prices have stabilized in most markets. Furthermore, the cost of insuring emerging-market bonds, which had spiked in the fall of 2008, is now back roughly to its pre-crisis level. The value of the dollar, which rose dramatically during the crisis, has retreated toward its value before the crisis (see Figure 3-2). From the end of March 2009 through December, the dollar depreciated 10 percent against a basket of currencies. The trade-weighted value is roughly at the same level as in the fall of 2007 and above its lows in 2008.

Potential financial problems still exist. Banks around the world may not have recognized all the losses on their balance sheets. The shock waves from the threatened default by Dubai World in November 2009 showed that there are still concerns in the market about potential bad debts on

various entities' balance sheets. There also are concerns in some countries that asset prices may be rising ahead of fundamentals. But the crush of near-bankruptcy across the system has clearly eased.

### *The Impact of Fiscal Policy*

The broad financial rescues and the monetary policy responses played crucial roles in stabilizing financial markets. Fiscal policy also played an essential role in the macroeconomic turnaround. A simple examination of G-20 advanced economies shows that while they all had broadly similar GDP contractions during the crisis, the high-stimulus countries—despite having much smaller automatic stabilizers—grew faster after the crisis than countries that adopted smaller stimulus packages. Table 3-2 shows the 2009 discretionary fiscal stimulus as a share of GDP, the tax share of GDP (which is a rough estimate of automatic stabilizers), as well as the GDP growth during the two quarters of crisis (2008:Q4 and 2009:Q1) and the second quarter of 2009 when growth resumed in many countries. Growth reappeared first in the high-stimulus G-20 countries.

Table 3-2  
Stimulus and Growth in Advanced G-20 Countries

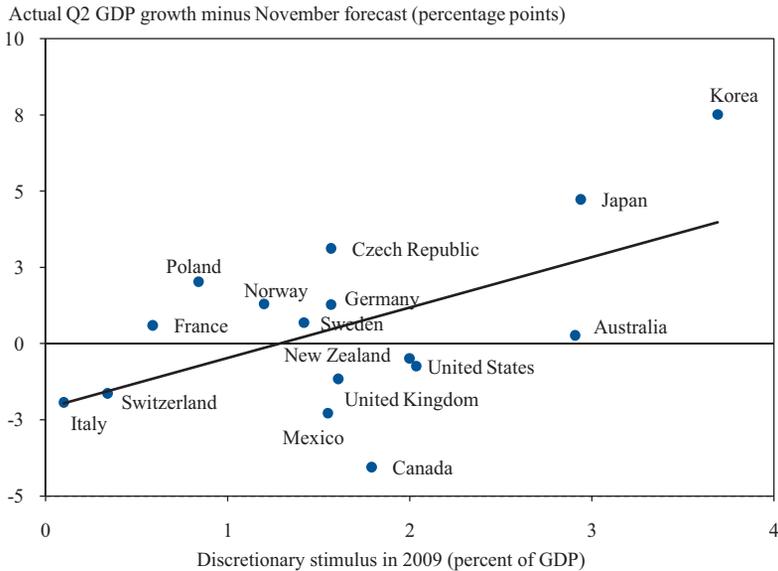
	Stimulus (% of GDP)	Stabilizers (% of GDP)	Growth during:	
			Crisis (%)	2009:Q2 (%)
High stimulus	3.2	28.4	-7.1	5.4
Mid stimulus	1.7	35.3	-8.3	-1.3
Low stimulus	0.3	43.2	-7.4	-0.3
United States	2.0	28.0	-5.9	-0.7

Notes: High countries are Australia, Japan, and Korea; middle countries are Canada, Germany, and the United Kingdom; low countries are France and Italy. Growth rates are annualized. Crisis refers to Q4:2008 and Q1:2009.

Sources: Organisation for Economic Co-operation and Development, Tax Database Table 0.1; Horton, Kumar, and Mauro (2009); Organisation for Economic Co-operation and Development (2009a); country sources.

Countries may have different typical growth patterns, however. Thus, to understand the impact of fiscal stimulus, one must estimate what would have happened had there been no stimulus—a counterfactual. Private sector expectations in November 2008—after the crisis had begun but before most stimulus packages were adopted—can serve as that counterfactual. Thus, one can compare actual growth minus predicted growth with the degree of stimulus to see whether those countries with large stimulus packages outperformed expectations once the stimulus policies were in place. The second quarter of 2009 is used as the test case. Figure 3-13 shows actual growth minus expected growth compared with 2009 discretionary fiscal

Figure 3-13  
Outperforming Expectations and Stimulus



Notes: The regression line is (growth - forecast) = -2.1 + 1.65 \* stimulus. The coefficient on stimulus is significant at the 95 percent confidence level. The R-squared is 0.31.  
Sources: J.P. Morgan Global Data Watch, Global Economic Outlook Summary Table, November 7, 2008; Horton, Kumar, and Mauro (2009); Organisation for Economic Co-operation and Development (2009a); country sources; CEA calculations.

stimulus for the OECD countries for which private sector forecasts were available on a consistent date.<sup>11</sup> Countries with larger stimulus on average exceeded expectations to a greater degree than those with smaller stimulus packages. The two countries in this exercise with the largest stimulus packages, Korea and Japan, outperformed expectations by dramatic amounts. Countries such as Italy that had virtually no stimulus performed worse than most. Among non-OECD countries, China had one of the largest fiscal stimulus packages, and in the second quarter of 2009 its growth was both rapid and far in excess of what had been expected in November 2008. Fiscal

<sup>11</sup> Stimulus is measured as in Table 3-1, using IMF and OECD estimates of 2009 fiscal stimulus. Forecasts are from J.P.Morgan. See Council of Economic Advisers (2009) for more details. That report examines more countries and a set of time series forecasts in addition to the private sector (J.P.Morgan) forecasts. The results are quite similar with a simple time series forecast. Results are slightly weaker with a broader sample, but that is not surprising because the swings in the economies in emerging markets were quite severe and difficult to predict, and the stimulus policies may operate somewhat differently in those nations. Council of Economic Advisers (2009) used Brookings estimates as well as OECD and IMF, but those ceased being updated in March, and thus this analysis uses only IMF and OECD estimates. Using the June estimates alone slightly weakens the results because stimulus announced late in the second quarter likely had little impact on growth in that quarter.

stimulus seems to have been important in restarting world economic growth in the second quarter of 2009.

After the second quarter of 2009, the relationship between stimulus and growth weakens somewhat. High-stimulus countries still exceed expectations relative to low-stimulus countries, but the relationship is not statistically significant. It may be that quarterly growth projections made nearly a year in advance are not precise enough a measure of a third-quarter growth counterfactual.

### *The World Economy in the Near Term*

While the return to GDP and export growth is encouraging, exports are still far below their level in the summer of 2008, and GDP is now far below its prior trend level. The IMF currently forecasts annual world growth of 3.1 percent in 2010; the OECD projects 3.4 percent.<sup>12</sup> For advanced countries, the forecasts are even more restrained: the IMF projects 1.3 percent, the OECD 1.9 percent for OECD countries. The IMF forecasts world trade to grow 2.5 percent in 2010; the OECD, 6.0 percent. These forecasts may be conservative. The IMF forecast would leave trade at a much lower share of GDP than before the crisis, and even if trade growth met the OECD's more aggressive forecast, trade would not reach its previous level as a share of GDP for some time. Given that trade declined faster than GDP in the crisis, it is possible it will continue to bounce back faster as well, surpassing these estimates.

***How Fast Will Countries Grow?*** There is an open question about how fast countries will grow following the crisis. After typical recessions, the magnitude of a recovery often matches the depth of the drop. In this way, GDP returns not only to its previous growth rate, but to its previous trend path as well. If, however, the world's advanced economies emerge from the crisis only slowly and simply return to stable growth rates, output will be on a permanently lower path. A financial crisis could lower the future level of output by generating lower levels of labor, capital, or the productivity of those factors. If the economy returns to full employment, and productivity growth remains on trend, though, capital should eventually return to its pre-crisis path because the incentives to invest will be high. Thus, as long as the economy eventually returns to full employment, the long-run impact of the crisis chiefly rests on productivity growth in the years ahead. Chapter 10 discusses the prospects and importance of productivity in more detail.

Some research suggests financial crises may result in a slow growth pattern (International Monetary Fund 2009a), with substantial average

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<sup>12</sup> IMF estimates are from International Monetary Fund (2009a). OECD estimates are from Organisation for Economic Co-operation and Development (2009b).

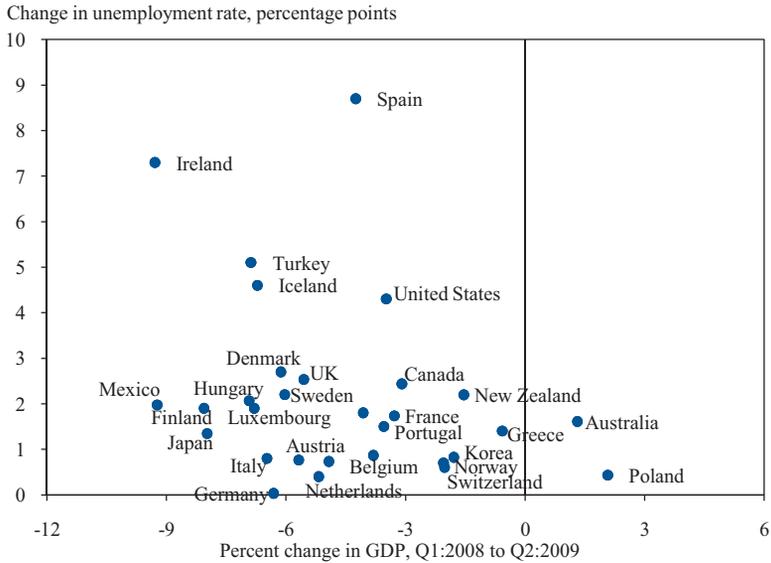
losses in the level of output in the years following a financial crisis. The same research, however, shows a wide variety of experiences following crises, with a substantial number of countries returning to or exceeding the pre-crisis trend level path of GDP. It is far too early to project the likely outcome of this recession and recovery, but there is hope that the aggressive policy responses and the potential for a sharp uptick in world trade—bouncing back with responsiveness similar in magnitude to its downturn—will return the path of GDP to previous trend levels in many economies.

**Concerns about Unemployment.** One reason for the great concern about the pace of growth after the recession is the current employment situation. What was a financial crisis and then a real economy and trade crisis has rapidly become a jobs crisis in many advanced economies. The OECD projects the average unemployment rate in OECD countries will have risen 2.3 percentage points from 2008 to 2009, with an average jobless rate of 8.2 percent in 2009. More worryingly, the OECD projects the group average will continue rising in 2010, and in some areas (such as the euro area) the jobless rate is expected to be even higher in 2011.

The United States has been an outlier in the extent to which the GDP contraction has turned into an employment contraction. Figure 3-14 shows the change in GDP and in the unemployment rate from the first quarter of 2008 to the second quarter of 2009. Typically, one would expect a line running from the upper left to the lower right because countries with small declines in GDP (or even increases) would have small increases in unemployment (lower right) and those with larger declines in GDP would have larger increases in unemployment (upper left). Countries broadly fit this pattern during the current crisis and recovery, but there are a number of aberrations. Germany saw a large contraction in GDP, and while growth has resumed, its one-year contraction was still sizable. Still, Germany's unemployment rate barely increased. In contrast, the United States suffered a relatively mild output contraction (for an OECD country), and yet it has had the largest jump in the unemployment rate outside of Iceland, Ireland, Spain, and Turkey, all of which had larger GDP declines.

There are several partial explanations for the large variation in the GDP-unemployment relationship across countries. The more flexible labor markets in the United States make the usual response of unemployment to output movements larger than in most other OECD countries; and, as discussed in Chapter 2, the rise in U.S. unemployment in the current episode has been unusually large given the output decline. Another factor is a policy response in some countries aimed at keeping current employees in current jobs. The extreme example of such a policy has been Germany's *Kurzarbeit* (short-time work) program, which subsidizes companies that put workers

Figure 3-14  
 OECD Countries: GDP and Unemployment



Sources: Organisation for Economic Co-Operation and Development, Quarterly National Accounts and Key Short-Term Economic Indicators; country sources.

on shorter shifts rather than firing them. The OECD estimates the German unemployment rate would be roughly 1 percentage point higher without the program. Because such programs benefit only those who already have jobs, they could hold down unemployment at the cost of a more rigid labor market. Labor market flexibility is generally seen as allowing lower unemployment on average over the course of the business cycle and as permitting a more efficient distribution of labor resources, thus enhancing productivity.

### ***Global Imbalances in the Crisis***

In addition to the unambiguous signs of problems in the U.S. economy going into the crisis, there were clear signals that the global economy was not well balanced. Global growth was strong from 2002 to 2007, but the growth was not well distributed around the world economy, with fast growth in some emerging markets and sluggish growth in some advanced economies. Further, that growth came with mounting imbalances in saving and borrowing across the world. U.S. saving was very low, which led to substantial borrowing from the rest of the world. Home price bubbles and overborrowing were not exclusive to the United States; the United Kingdom, Spain, and many other economies also borrowed extensively, helping inflate

asset prices in those economies. This borrowing was paired with very high saving in some countries, particularly in emerging Asia.

The extent to which the global imbalances were a cause of the crisis or represented a symptom of poor policy choices in different countries is a question of active debate (see Obstfeld and Rogoff 2009 for discussion). The current account (net borrowing from or lending to the rest of the world) can be defined as a country's saving minus its investment. Thus, some argue that forces in the rest of the world cannot be deterministic of a country's current account balance. A country saves or borrows based on its own choices. In this formulation, the imbalances were merely a symptom. In fact, some argued the imbalances were beneficial because savings were channeled away from inefficient financial markets in poor countries toward what were thought to be more efficient markets in rich countries. Conversely, some argue that the influx of global savings into the United States distorted incentives by keeping interest rates too low and led to overborrowing and asset bubbles. In this view, the imbalances played a leading role in the crisis.

The truth almost certainly lies somewhere in between. The influx of global savings into the United States did lower borrowing rates and encouraged more spending and less saving within the U.S. economy. This may have allowed the credit expansion and related asset price bubbles to continue longer than they could have otherwise. At the same time, even if the global savings in some sense led to U.S. borrowing, the failure of the financial system to use that borrowing productively and the failure of regulation to make sure risk was being treated appropriately were surely partly to blame for the crisis.

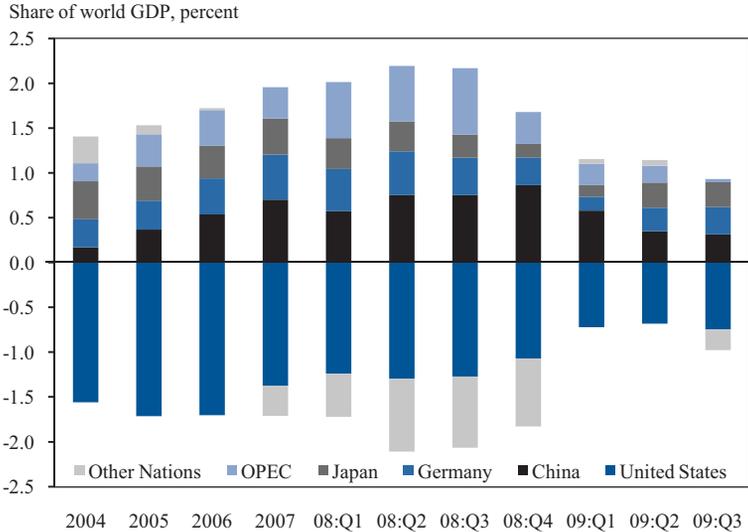
As the U.S. economy seeks to find a more sure footing and a growth path less dependent on borrowing and bubbles, world demand needs to be redistributed so that it is less dependent on the U.S. consumer and does not cause global imbalances to reappear and contribute to distortions in the economy. Fixing the imbalances can help provide more demand for the U.S. economy. But these imbalances also need to be treated as symptoms of deeper regulatory and policy failures. Fixing the imbalances alone will not prevent another crisis.

Since the onset of the crisis, the imbalances have partially unwound (the likely future path of the U.S. current account is discussed in more detail in Chapter 4). The U.S. current account deficit, which had built to over 6 percent of GDP in 2006, was on a downward path before the crisis struck in full force, falling to under 5 percent of GDP at the start of 2008. After the crisis hit, it fell below 3 percent of GDP in the first quarter of 2009. Major surplus countries—China, Germany, and Japan—have all seen a reduction in their current account surpluses from the highs of 2007. In all three

cases, the surpluses have stabilized at substantial levels (in the range of 3–5 percent of GDP), but they are notably down from their highs. One essential part of the response to the crisis has been the substantial fiscal stimulus implemented by these three countries, which has helped demand in these countries stay stronger than it otherwise would have been.

Figure 3-15, which shows current account imbalances scaled to world GDP, demonstrates how much of total world excess saving or borrowing is attributable to individual countries. As the figure makes clear, by 2005 and 2006, the United States was borrowing nearly 2 percent of world GDP, and by the end of 2008, China was lending nearly 1 percent of world GDP. During the crisis, the surpluses of OPEC (Organization of Petroleum Exporting Countries) countries, Japan, and Germany contracted, and the United States is now borrowing less than 1 percent of world GDP. China’s surplus is also smaller than before the crisis, but China is still lending nearly 0.5 percent of world GDP, and OPEC surpluses may rise as well. But by the third quarter of 2009, the degree of imbalance was substantially lower than just a year earlier. There is hope that the short-run moves in these current account balances are not simply cyclical factors that will return quickly to

Figure 3-15  
Current Account Deficits or Surpluses



Notes: Sample limited by data availability. In the figure, OPEC includes Ecuador, Iran, Kuwait, Saudi Arabia, and Venezuela; and Other Nations includes all other countries with quarterly current account data. Third quarter 2009 data for both OPEC and Other Nations were incomplete at the time of writing.

Sources: Country sources; CEA estimates.

former levels but rather that they represent a more sustained rebalancing of world demand.

Net export growth is often a key source of growth propelling a country out of a financial crisis. But in a global crisis, not every country can increase exports and decrease imports simultaneously. Someone must buy the products that are being sold, and the world's current accounts must balance out. Thus far, the crisis has come with a reduction in imbalances, with strong growth and smaller surpluses in many surplus countries. Whether these shifts become a permanent part of the world economy or policies and growth models revert to the pattern of the 2000s will be an important area for policy coordination.

## CONCLUSION

The period from September 2008 to the end of 2009 will be remembered as a historic period in the world economy. The drops in GDP and trade may stand for many decades as the largest worldwide economic crisis since the Great Depression. In contrast to the Depression, however, the history of the period may also show how aggressive policy action and international coordination can help turn the world economy from the edge of disaster. The recovery is unsteady and, especially with regard to unemployment, incomplete, but compared with a year ago, the positive shift in trends in the world economy has been dramatic.



## C H A P T E R 4

# SAVING AND INVESTMENT

The United States appears poised to begin its recovery from the most severe recession since the Great Depression. But as discussed in Chapter 2, the recession has been unusually deep, and the crisis has caused declines in credit availability as well as weak consumer and business confidence. As a result, achieving the private spending necessary to support a robust and full recovery has been, and will continue to be, challenging.

Moreover, as the President has repeatedly emphasized, it is not enough simply to return to the path the economy was on before the slump. The growth that preceded the recession saw high consumption spending, low private saving, excessive housing construction, unsustainable run-ups in asset prices (especially for assets related directly or indirectly to housing), and high budget and trade deficits. That path was unstable—as we have learned at enormous cost—and undermined long-run prosperity. Thus, as the economy recovers, a rebalancing will be necessary. The composition of spending needs to be reoriented in a way that will put us on a path to sustained, stable prosperity.

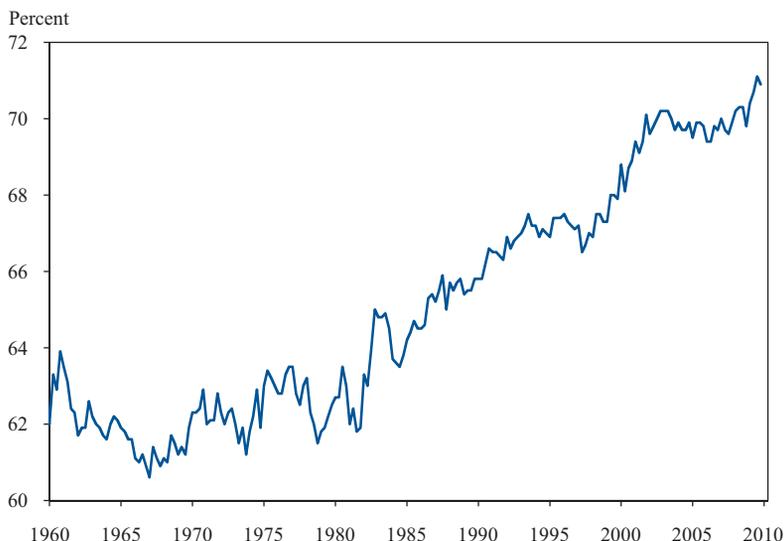
In thinking about the twin challenges of recovery and reorientation, it is useful to consider the division of demand into its components. Overall or aggregate demand can be classified into personal consumption expenditures, residential investment, business investment, net exports, and government purchases of goods and services. Government purchases, which consist of such items as Federal expenditures on national defense and state and local spending on education, are relatively stable. This is especially true when one recalls that government transfers, such as spending on Medicare or Social Security, are not part of government purchases but rather are elements of personal income. Thus, it is the behavior of the remaining components that will be central to addressing the challenges of generating enough demand for recovery and a better composition of demand for long-run growth and stability.

This chapter lays out a picture of how the components of private demand behaved during the downturn and how they are likely to evolve as the economy recovers and once it returns to full employment. The chapter describes the transition that has already occurred away from low personal saving and high residential investment, as well as the transition that needs to occur toward greater business investment and net exports. It also describes the President’s initiatives for encouraging the transitions necessary for long-run prosperity and stability.

## THE PATH OF CONSUMPTION SPENDING

Figure 4-1 shows the share of gross domestic product (GDP) that takes the form of production of goods and services directly purchased by consumers. The figure has two key messages. First, consumption represents a substantial majority of output. As a result, movements in consumption play a central role in macroeconomic outcomes. Second, the fraction of output devoted to consumption has been rising over time, leaving less room for components that contribute to future standards of living. The behavior of consumption will therefore be central to addressing both the shorter-run challenge of generating a strong recovery and the longer-run challenge of rebalancing the economy.

Figure 4-1  
Personal Consumption Expenditures as a Share of GDP

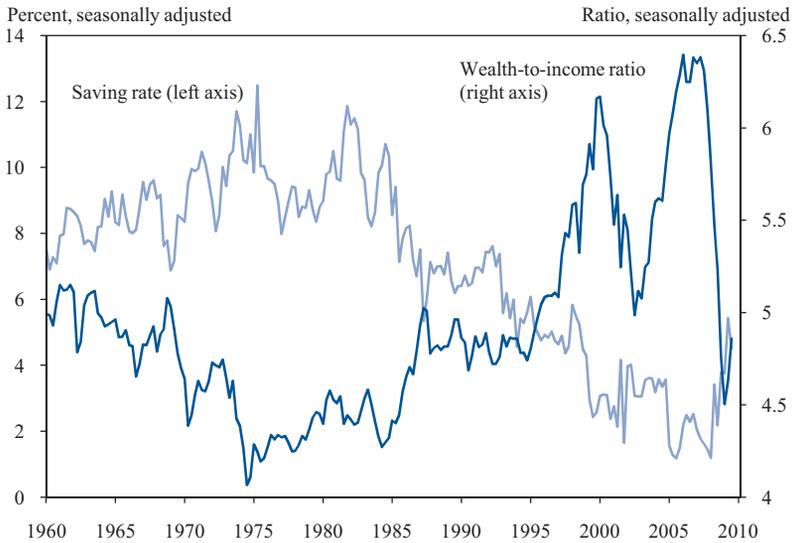


Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.10.

## The Determinants of Saving

To understand the behavior of consumption, it is critical to consider how households divide their disposable income between consumption and saving. Figure 4-2 shows the personal saving rate (that is, the ratio of saving to disposable personal income) since 1960 (left axis), along with the ratio of household wealth to disposable personal income (right axis).

Figure 4-2  
Personal Saving Rate Versus Wealth Ratio



Sources: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 2.1; Federal Reserve Board, Flow of Funds Table B.100.

The big swings in wealth reflect asset market booms and busts. Much of the drop in wealth in the early 1970s reflects the stock market decline associated with the first oil price shock. The stock market booms of the mid-1980s and the late 1990s are obvious, as is the decline in stock prices in the early 2000s. The wealth decline in 2008–09 was the largest such experience in the sample, reflecting large contributions from falling house prices as well as stock prices.

Paralleling the behavior of the consumption-output ratio, the saving rate showed no strong trend before roughly 1980. But it has shown a marked downward trend since then. Economic theory suggests a variety of factors that should influence saving, most notably changes in the demographic structure of the population, the growth rate of income, and the real after-tax interest rate. None of these three factors, however, provides a compelling explanation for the fluctuations in the saving rate evident in the figure.

Indeed, some of the factors should probably have pushed saving up in recent decades, not down. A 1991 study, for example, predicted that the saving rate would rise as the baby boom generation entered its high-saving preretirement years (Auerbach, Cai, and Kotlikoff 1991). Instead, the saving rate fell steadily as the boomers approached retirement (the first boomers claimed early Social Security benefits in 2008).

Figure 4-2 suggests to the eye, and statistical analysis confirms, a strong negative association between the saving rate and the wealth-to-income ratio. This relationship has been interpreted as reflecting the effect of wealth on spending: a run-up in wealth leads to less need for saving. Such an interpretation is unsatisfying, however, because it leaves a key question unanswered: If wealth movements cause saving rate movements, what causes wealth movements? More broadly, it leaves open the possibility that both saving choices and asset price movements are a consequence of some deeper underlying force. For example, an increase in optimism about future economic conditions might lead both to a spending boom and to a general bidding up of asset prices. In that case, the true moving force would not be wealth changes per se; instead, both asset prices and saving would be responding to the increase in optimism.

Survey data measuring “consumer sentiment” or “consumer confidence” do, in fact, have substantial forecasting power for near-term spending growth, and are also associated with contemporaneous movements in asset prices (Carroll, Fuhrer, and Wilcox 1994). Such surveys are therefore a useful part of a macroeconomist’s forecasting tool kit. But such surveys have not proven useful in explaining long-term trends like the secular decline in the saving rate.

Emerging economic research suggests another underlying explanation that may be more potent: movements in the availability of credit. A substantial academic literature has documented the expansion of credit since the era of financial liberalization that began in the early 1980s (Dynan 2009). Many factors have contributed to this expansion; perhaps the most prominent explanation (aside from the liberalization itself) is the telecommunications and computer revolutions, which together have permitted the construction of ever-more-detailed databases on consumer credit histories, giving creditors a far more precise ability to tailor credit offers to the personal characteristics of individual borrowers (Jappelli and Pagano 1993). A beneficial effect of this information revolution has been that many people who had previously been unable to obtain credit have for the first time been able to borrow to buy a home, to start a business, or to undertake many other useful activities (Edelberg 2006; Getter 2006).

A reduction in saving, however, is almost the inevitable consequence of a general increase in the ability to borrow. If there is less need to save for a down payment for a home, for a child's education, for unforeseen emergencies, or for spending of any other kind, then the likelihood is that less saving will be done. Of course, eventually the saving rate should mostly recover from any dip caused by a one-time increase in the availability of credit, because whatever extra debt was incurred must be paid back over time (and paying back debt is another form of saving). This recovery in saving, however, may take a long time. If, in the meantime, credit availability increases again, the gradual small increase in saving that reflects debt repayment could easily be obscured by the new drop in saving occasioned by the continuing expansion in credit availability.

How much of the decline in the saving rate was due to a gradual, but cumulatively large, increase in credit availability is not easy to determine, partly because an aggregate measure of credit availability is difficult to construct. Recent research on commercial lending has argued that a good measure of the change in credit supply is provided by the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices, in which managers at leading financial institutions are asked for their assessments of credit conditions for businesses (Lown and Morgan 2006). Building on that research, one study has proposed that a measure of the level of credit availability to consumers can be constructed simply by accumulating the sequence of readings from this survey's measure of credit availability to consumers (Muellbauer 2007).<sup>1</sup>

Economic theory suggests that one further element may be important in understanding spending and saving choices around times of recession: the intensity of consumers' precautionary motive for saving. Because the risk of becoming unemployed is perhaps the greatest threat to most people's future financial stability, the unemployment rate has sometimes been used as a proxy for the intensity of the precautionary saving motive.

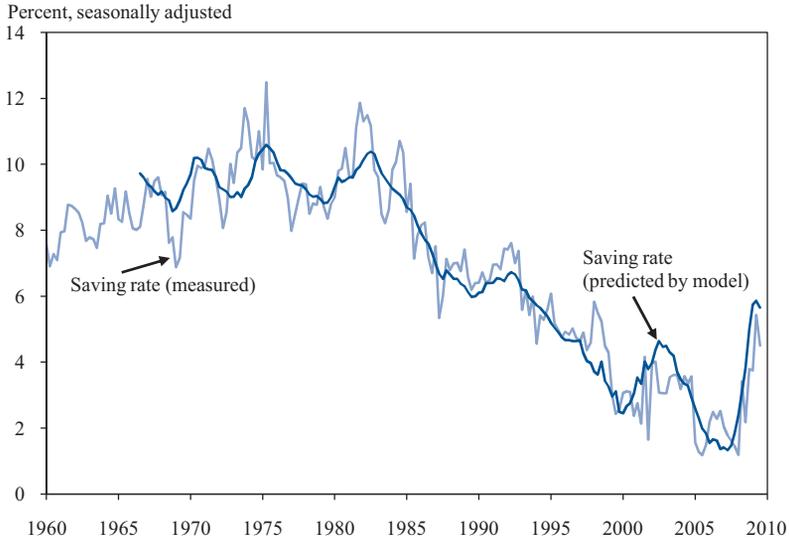
### ***Implications for Recent and Future Saving Behavior***

Figure 4-3 shows the relationship between the measured saving rate and a simple statistical model that relates the saving rate to the wealth-to-income ratio, a slightly modified version of Muellbauer's credit availability index, and the unemployment rate. The statistical model is estimated over the sample period 1966:Q3 to 2009:Q3. All three variables have statistically important predictive power, with the two most important measures being the measure of credit conditions and the wealth-to-income ratio.

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<sup>1</sup> Specifically, each quarter the survey asks about banks' willingness to make consumer installment loans now as opposed to three months ago.

Figure 4-3  
Personal Saving Rate: Actual Versus Model

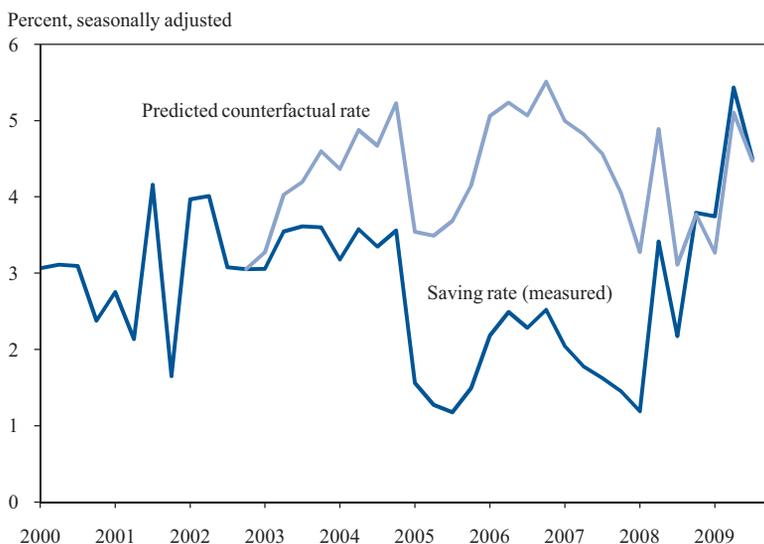


Sources: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 2.1; CEA calculations.

Figure 4-4 uses this simple framework to ask what the path of the saving rate might have looked like if the increase in credit availability and the housing price boom had not occurred. (To be exact, the figure shows what the model says the saving rate would have been if the wealth-to-income ratio had remained constant from the first quarter of 2003 to the fourth quarter of 2007, and if credit conditions had neither expanded nor contracted; the first quarter of 2003 is chosen as the starting point because in that quarter the wealth-to-income ratio was close to its average historical value.) In this counterfactual history, the personal saving rate would have been, on average, about 2 percentage points higher over the 2003–07 period.

Of course, a far more important consequence than the higher saving rate might have been the avoidance of the financial and real disturbances caused by the housing price boom and subsequent crash. But taking the crash as given, Figure 4-3 shows that the model does a reasonably good job in tracking the dynamics of the saving rate over the period since the business cycle peak. All three elements of the model contribute to the model's predicted rise in the personal saving rate over the past couple of years: the increase in the unemployment rate, the sharp drop in asset values evident in Figure 4-2, and the steep drop in credit availability as measured by the Senior Loan Officer Opinion Survey.

Figure 4-4  
Actual Personal Saving Versus Counterfactual Personal Saving



Sources: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 2.1; CEA calculations.

The saving model also has implications for the future path of spending. Because of the important role it finds for credit availability, the model suggests that the speed of the recovery in spending is likely to be closely tied to the pace at which the financial sector returns to health. This point underscores a chief motivation for the Administration’s efforts to repair the damage to the financial system: a full economic recovery is unlikely until and unless the financial system is repaired. The vital role that a healthy financial sector plays in the functioning of the economy explains the urgency with which the Administration has been pressing Congress to pass a comprehensive and effective reform of the financial regulatory system (see Chapter 6 for a detailed discussion of the Administration’s proposals).

Over a longer time frame, a resumption seems unlikely of the past pattern in which credit growth persistently outpaces income growth. Instead, credit might reasonably be expected to expand, in the long run, at a pace that roughly matches the rate of income growth. Similarly, in keeping with the long-run stability of the wealth-to-income ratio evident in Figure 4-2, wealth plausibly might grow at roughly the same pace as income—or perhaps a bit faster if investment can sustain an increase in capital per worker. Finally, although unemployment is likely to remain above its normal rate for some time, it too can be expected to return to historically normal values in the medium run. Under these conditions, the model suggests that the personal

saving rate will eventually stabilize somewhere in the range of 4 to 7 percent, somewhat below its level in the 1960s and 1970s, but well above its level over the past decade.

The saving rate has already risen sharply over the past two years (which reflects an even steeper drop in consumption than in income). As credit conditions and the unemployment rate return to normal, it is plausible to expect a temporary partial reversal of the recent increase, even if asset values do not return to their pre-crisis levels. It would not be surprising, therefore, if the saving rate dipped a bit over the next year or two before heading toward a higher long-run equilibrium value. The prospect of temporary fallback in the saving rate is also plausible as a consequence of the expected withdrawal of some of the temporary income support policies that were part of the stimulus package. On balance, however, the United States seems now to be on a trajectory that will eventually result in a more “normal,” and more sustainable, pattern of household saving and spending than the one that has prevailed in recent years.

While the underlying economic forces sketched here seem likely to lead eventually to a higher saving rate even in the absence of policy changes, the Administration has proposed a variety of saving-promoting policy changes to enhance that trend over the longer term. These include increasing the availability of 401(k)-type saving plans and encouraging employers to gradually increase default contribution rates (and to ensure that new employees’ default saving choices reflect sound financial planning). Economic research suggests that people assume that if their employer offers a retirement saving plan, the default saving rate in that plan probably reflects a reasonably good choice for them, unless their circumstances are unusual (Benartzi and Thaler 2004).

## **THE FUTURE OF THE HOUSING MARKET AND CONSTRUCTION**

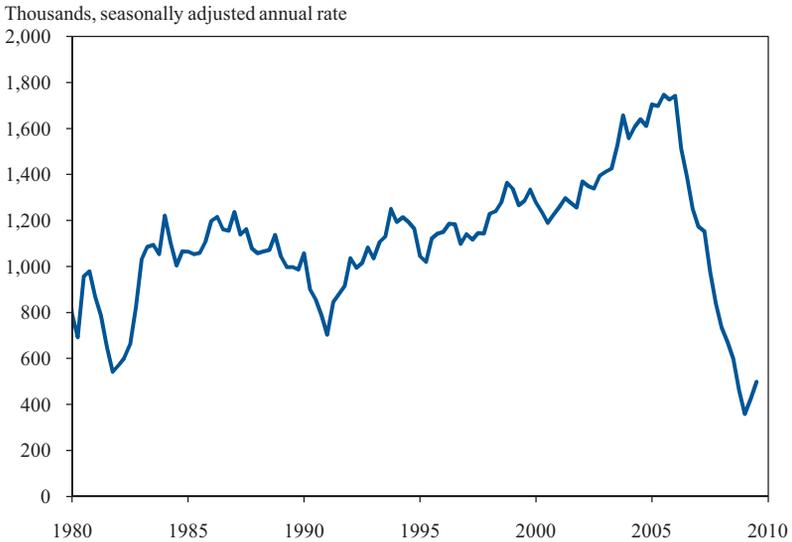
The boom in construction spending that characterized the middle years of the past decade made a substantial contribution to growth while it lasted. When the residential investment engine began to sputter around the middle of 2006, and then to stall, the ensuing correction in the sector was correspondingly steep. With the benefit of hindsight, it is now clear that much of the mid-decade’s frenetic activity was based on unsound financial decisions rather than sustainable economic developments. As a consequence, construction has declined to below-normal levels as the excesses work off. For the future, construction activity is expected to pick up and

contribute to the economic recovery, although this activity is likely to be well below the very high levels it reached in the mid-2000s.

### *The Housing Market*

The residential investment boom can be measured in several ways. As Figure 4-5 shows, new construction of single-family housing units soared in the first half of the 2000s. Builders were constructing 30 percent more single-family housing units a year in the expansion of the 2000s than in the 1990s boom. Housing investment as a share of GDP averaged more than 5.5 percent over the 2002–06 period, compared with an average of only 4.7 percent from 1950 to 2001. Figure 4-6 shows that from 1995 to 2005 the homeownership rate rose from 65 percent to 69 percent as mortgage underwriting standards loosened, especially in the later part of the period.

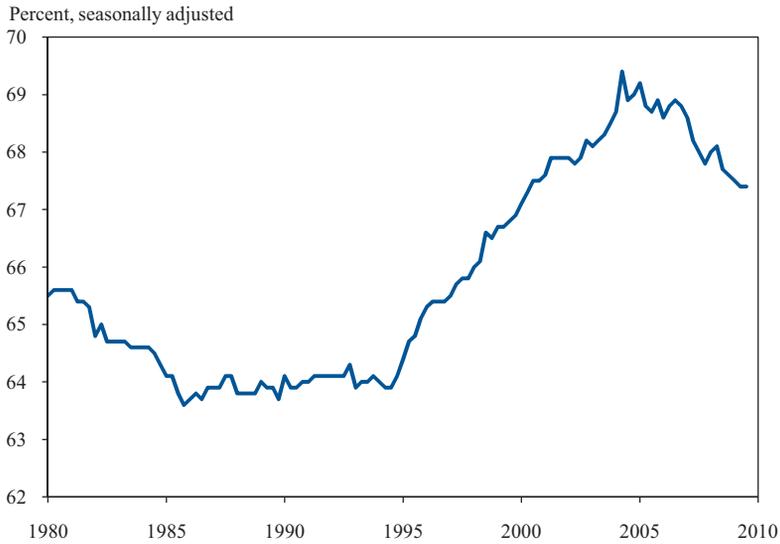
Figure 4-5  
Single-Family Housing Starts



Source: Department of Commerce (Census Bureau), New Residential Construction Table 3.

It is now apparent that the mid-2000s level of new construction was unsustainable. Analysis by the Congressional Budget Office (2008) and Macroeconomic Advisers (2009) suggests the mid-2000s pace of starts was well in excess of the underlying pace of expansion in demand for new housing units based on household formation and other demographic drivers.

Figure 4-6  
Homeownership Rate



Source: Department of Commerce (Census Bureau), Residential Vacancies and Homeownership Table 4.

The boom was followed by an equally dramatic bust. From their peak in the third quarter of 2005 to the first quarter of 2009, single-family housing starts fell by more than a factor of four. The homeownership rate reversed course, and by the second quarter of 2009 had returned to its 2000 level. The share of housing investment in GDP plummeted to 2.4 percent in the second quarter of 2009.

Just as the mid-decade's high levels of construction and housing market activity were not sustainable, the recent extremely low levels of construction will not persist indefinitely. In 2009, housing starts and the share of housing investment in GDP were well below their previous historical lows. In the long run, sounder underwriting standards will require more would-be homeowners to take time to save for a down payment before buying a home, suggesting that the homeownership rate will ultimately settle at a level lower than its recent peaks. Nonetheless, as the population grows and the housing stock depreciates, new residential construction will be required to meet demand. The analyses by the Congressional Budget Office (2008) and Macroeconomic Advisers (2009) suggest that the underlying demographic trend of household formation is consistent with growth in demand of between 1.1 million and 1.3 million new single-family housing units per year, more than double the pace of single-family housing starts in November 2009. Indeed, since the second quarter of 2009, housing construction has already rebounded a bit, making its first positive

contribution to GDP growth in the third quarter of 2009 since the end of 2005. But, as described in Chapter 2, the stocks of new homes and existing homes for sale, vacant homes that are not currently on the market, and homes that are in the process of foreclosure and that are likely to be put on the market at some point remain high. As a result, construction demand is likely to rise to its long-run level only gradually while some demand is met by the stock of existing units.

In short, as the housing market stabilizes and returns to a more normal condition, its role as a major drag on economic growth seems to be ending, and it is likely to contribute to the recovery. But residential construction cannot be expected to be the engine for GDP growth that it was during the housing boom of the mid-2000s.

### ***Commercial Real Estate***

The market for commercial real estate has also suffered in the recession. Commercial real estate encompasses a wide range of properties, from small businesses that occupy a single stand-alone structure to large shopping malls owned by a consortium of investors.

Problems in the commercial real estate sector are less obviously a result of overbuilding than those in the residential sector; instead, they reflect the sharp decline in demand for commercial space and the overall decline in the economy. The value of commercial real estate increased notably between 2005 to 2007, spurred by easy credit conditions, as measured for example in the Senior Loan Officer Opinion Survey. By the end of 2004, the net number of banks reporting they had eased lending standards for commercial real estate loans was persistently larger than at any point in the history of the series. Most banks did not begin tightening standards again until the end of 2006. The relative quantity of financing also increased over this period; the ratio of the change in the value of commercial real estate mortgages to new construction, which should increase when debt financing becomes relatively attractive, reached a 45-year high in 2003 and then continued to climb, peaking at the end of 2005 at more than three times the historical average.<sup>2</sup>

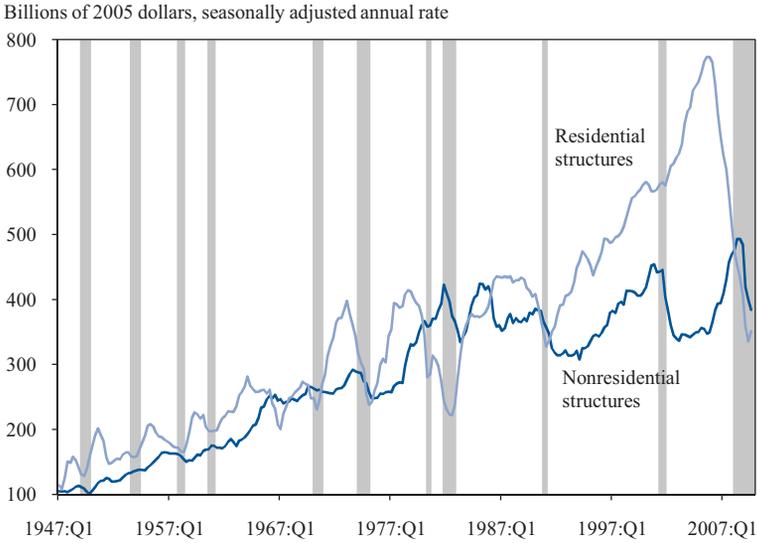
In the nonresidential sector, high prices did not translate into a dramatic increase in new construction (Figure 4-7). Rather, existing owners of nonresidential properties used the cheap financing and price increases to refinance or sell. Several factors appear to have played a role in limiting

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<sup>2</sup> The numerator of the ratio is the seasonally adjusted change in commercial and multifamily residential mortgages (Federal Reserve, Flow of Funds Tables F219 and F220). The denominator is seasonally adjusted construction of commercial and health care structures, multifamily structures, and miscellaneous other nonresidential structures (Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts Table 5.3.5). The median of the ratio from 1958 to 2000 is 0.46, while the 2005:Q4 value is 1.50.

new investment in this sector. First, a close look at Figure 4-7 shows that nonresidential construction has historically exhibited much less volatility than residential construction, a pattern that also held true during the recent boom. Second, developers seem to have been wary of overbuilding because of unhappy experiences in previous expansions. A final dampening factor has been that construction resources were tied up in the residential construction sector. Indeed, only when residential construction slowed in 2006 did nonresidential construction begin to show larger gains.

Figure 4-7  
Fixed Investment in Structures by Type

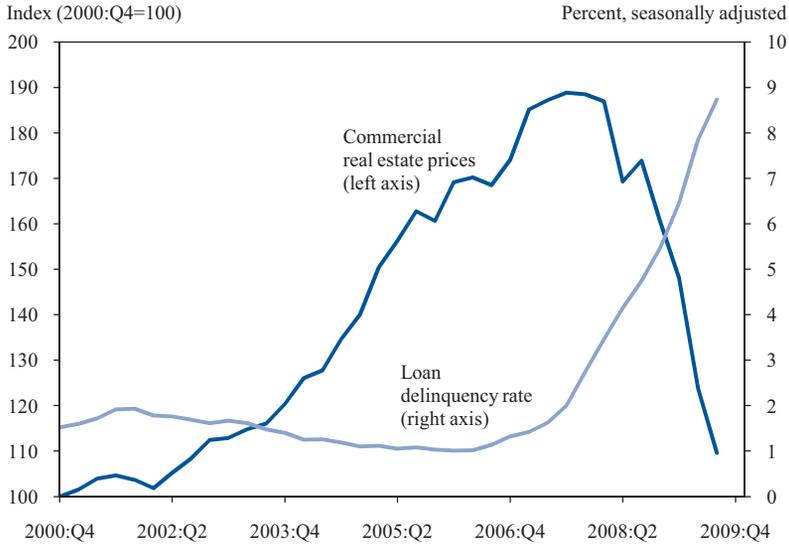


Note: Grey shading indicates recessions.

Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 5.3.6.

Commercial real estate values have declined dramatically since 2007. As Figure 4-8 shows, according to the Moody's/REAL Commercial Property Index, which tracks same-property price changes for commercial office, apartment, industrial, and retail buildings, commercial real estate prices fell 43 percent from their peak in October 2007 to September 2009. A steep increase in vacancy rates, stemming from weakness in the overall economy, has been one important reason for these declines in value: the commercial real estate services firm CB Richard Ellis reports that vacancy rates for offices increased from 12.6 percent in mid-2007 to 17.2 percent in the third quarter of 2009. Before the recession, vacancy rates were generally declining.

Figure 4-8  
Commercial Real Estate Prices and Loan Delinquencies



Sources: Moody's/Real Estate Analytics LLC, Commercial Property Index; Federal Reserve Board.

As commercial real estate values have declined, owners have found it difficult to refinance their debt because loan balances now appear large relative to the properties' value. Nearly half of the banks responding to the Senior Loan Officer Opinion Survey in the third quarter of 2009 reported that they continued to tighten standards on commercial real estate loans, whereas none of the respondents reported having eased standards. Since commercial real estate loans typically are relatively short term, an inability to refinance debt has led to a sharp rise in delinquencies and foreclosures. Figure 4-8 shows that the proportion of commercial real estate loans with payments at least 30 days past due rose from about 1 percent during most of the decade to almost 9 percent by the third quarter of 2009. Distress has made lenders reluctant to provide financing for new projects. Overall, the value of commercial and multifamily residential mortgages declined in each of the first three quarters of 2009 (Federal Reserve Flow of Funds Tables L.219 and L.220). Tight credit and the increase in sales of distressed properties have fed into further price declines, generating a negative feedback loop between property values and conditions in the sector.

As private sources of funding have dried up, the Federal Reserve has helped fill the gap through the Term Asset-Backed Securities Loan Facility (TALF). In June 2009, the TALF made lending available to private financial market participants against their holdings of existing commercial

mortgage-backed securities (CMBS), thereby increasing liquidity in the CMBS market. In November 2009, the TALF made its first loans against newly issued CMBS. The provision of TALF financing for these newly issued securities may prove particularly important in allowing borrowers to refinance.

The negative feedback loop between credit conditions, the sale of distressed commercial properties, and commercial property values may lead to further price declines. Eventually, however, a combination of economic recovery and an improvement in financing conditions should help prices stabilize. Still, as with the residential mortgage market, commercial real estate financing will likely not return any time soon to the easy terms that prevailed before the collapse. Experience in previous business cycles suggests that recovery of the sector will lag the economy as a whole.

## **BUSINESS INVESTMENT**

If consumption and construction are not the drivers of growth going forward in the way they were in the early 2000s, two components of private demand are left to fill the gap: business investment excluding structures, and net exports.<sup>3</sup> Nonstructures investment could well become again (as it was in the 1990s) a driving force in the expansion of aggregate demand and economic production. And in the long run, its share in GDP could reach levels higher than those of the first part of the decade.

### ***Investment in the Recovery***

Investment spending (other than structures) plummeted in late 2008 and early 2009. This investment spending fell so low that, after accounting for depreciation, estimates of the absolute stock of capital showed stagnation in 2008 and even a decline in the first quarter of 2009. Falling spending in this category reflected falling business confidence, as indicated, for example, in the Federal Reserve Bank of Philadelphia's Business Outlook Diffusion Index; this index was negative every month from October 2008 to July 2009, signaling that more businesses thought conditions were deteriorating than thought they were improving. Similarly, the National Federation of Independent Business Index of Small Business Optimism hit its lowest point since 1980 in March 2009.

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<sup>3</sup> In the National Income and Product Accounts, construction of commercial structures is classified as part of business investment. Given that the boom and bust were concentrated in residential and commercial construction, however, for discussing recent and prospective developments it is more useful to consider commercial construction investment together with residential investment, as was done in the previous section. Thus, the discussion that follows is largely concerned with nonstructures investment.

Investment of this kind firmed in the second half of 2009, coinciding with improvements in business confidence. Indeed, investment in equipment and software increased at a 13 percent annual rate in the fourth quarter. Nevertheless, the cumulative erosion has been so substantial that years of strong growth will be necessary to fully recover from the nadir. As a result, recovery of spending in this area is likely to make a substantial contribution to the recovery of the overall economy.

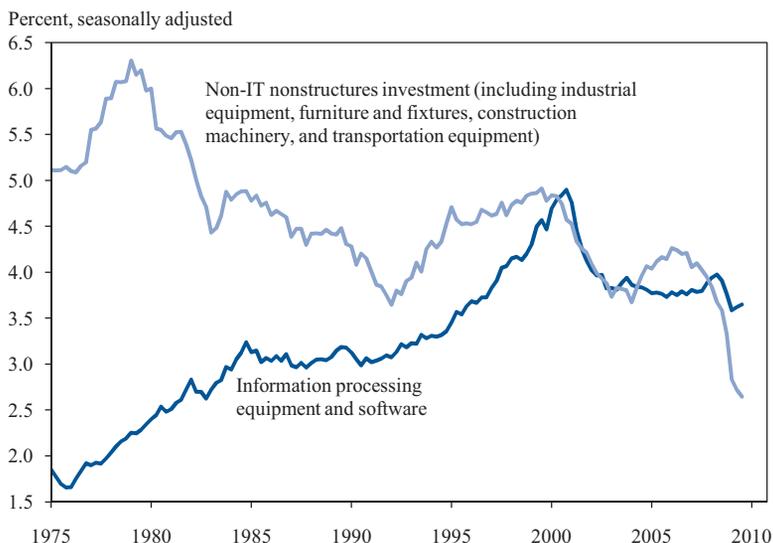
### ***Investment in the Long Run***

In the long run, the share of business investment is likely not just to return to its pre-recession levels, but to exceed them. During the boom of the 1990s, the share of business investment in equipment and software as a fraction of GDP rose from a post-Gulf-War recession low of 6.9 percent in 1991 to 9.6 percent in 2000. During that period, investment in information processing equipment and software made the largest contribution to the increase, as shown in Figure 4-9. Information technology (IT) investment grew an astounding 18 percent per year on average from 1991 to 2000. Other investment in equipment and software, which includes industrial, transportation, and construction equipment, accelerated as well, and grew as a share of GDP over this period. This high level of investment in the 1990s increased industrial capacity by an average of 4 percent per year.

As the figure shows, the boom came to an end at the beginning of the 2000s, when investment in every category of equipment and software fell sharply as a share of GDP. The recovery in business investment in equipment and software after the 2001 recession was weak. IT investment grew at a historically tepid pace of 6 percent per year from 2003 to 2007, far below pre-2000 growth rates. Non-IT investment growth was also muted, with spending on industrial equipment growing at an annual pace of only 3.7 percent from 2003 to 2007, down from an average of 5.4 percent in the 1990s. Investment in transportation equipment surpassed its 1999 peak only for one quarter in 2006. In the recovery following the 2001–02 recession, the peak value of non-IT equipment investment as a share of GDP was only 4.3 percent (in 2006), a level that does not even match the historical *average* value of that series in the period from 1980 to 2000. Production capacity in the sector grew an average of 0.6 percent per year from 2003 to 2007, substantially below the average pace of growth in the 1990s. Taken as a whole, these figures suggest that business investment may have been abnormally low over the course of the post-2001 expansion.

There are strong reasons to expect investment's role in the economy will be larger in the future. In the long run, the real interest rate will adjust to bring the demand for the economy's output in line with the economy's

Figure 4-9  
Nonstructures Investment as a Share of Nominal GDP



Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 5.3.5.

capacity. The increase in private saving described in the first part of the chapter, together with the policies to tackle the long-run budget deficit that are the subject of the next chapter, should help maintain low real interest rates. By keeping the cost of investing low, these low real interest rates should help to encourage investment.

At the same time, other forces should help increase investment at a given cost of borrowing. A number of promising technological developments offer the prospect that businesses will be able to find many productive purposes for new investments, ranging from new uses of wireless electromagnetic spectrum, to new applications of medical and biological discoveries opened up by DNA sequencing technologies, to environmentally friendly technologies like new forms of production and distribution of clean energy (see Chapter 10 for more on these subjects).

Another form of investment is business spending on research and development (R&D). Such spending can be interpreted as investment in the accumulation of “knowledge capital.” Ideally, private investments in R&D will dovetail with complementary public investments in knowledge capital through basic research and scientific and technological infrastructure. The Administration’s commitment to fostering the connections between public and private investments in knowledge production has been strongly signaled in both the Recovery Act and the President’s fiscal year 2010 budget (Office of Management and Budget 2009). The Recovery Act included \$18.3 billion

of direct spending on research, one of the largest direct increases in such spending in the Nation's history. In addition, more than \$80 billion of Recovery Act funds were targeted toward technology and science infrastructure. The Administration's first budget proposed to double the research spending by three key science agencies: the National Science Foundation, the Department of Energy's Office of Science, and the Department of Commerce's National Institute of Standards and Technology. And to foster private sector innovation, the budget also included the full \$74 billion cost of making the research and experimentation tax credit permanent in order to give businesses the certainty they need to invest, innovate, and grow.

With reduced demand from consumption and housing tending to make the real interest rate lower than it otherwise would be, and increased investment demand from the many newly developing technologies and incentives for R&D, a larger portion of the economy's output is likely to be devoted to investment. And, because business investment contributes not only to aggregate demand but also to aggregate supply and productivity, a larger role for investment will create a stronger economy going forward.

## THE CURRENT ACCOUNT

The picture of future growth in the United States described in the previous sections depends less on borrowing and consumption than did growth in the past decade. This view has important implications for our interactions with other countries and the current account.

### *Determinants of the Current Account*

The current account is the trade balance plus net income on overseas assets and unilateral transfers like foreign aid and remittances. The trade balance, or net exports, represents the bulk of the current account and is responsible for a large majority of short-run movements in it. To a first approximation, a current account deficit implies that the trade balance is negative or, equivalently, that our exports are less than our imports. At the same time, the current account deficit must also be matched by the net borrowing of the United States from the rest of the world. If we spend more than we earn, we must borrow the money to do so. In the national income accounting sense, the definition of the current account can be reduced to national saving minus investment (plus some measurement error).

This accounting definition provides a description but not an explanation of the drivers of the current account. One important driver is the business cycle. As Box 4-1 explains, over the last 30 years, the U.S. current account deficit tended to be larger when the economy was booming

and unemployment was low. In a boom, investment tends to rise and saving tends to fall, generating a current account deficit. When the economy struggles, investment often falls and saving often rises, generating a surplus (or a smaller deficit). In countries that rely more on exports to drive their growth, an acceleration in growth can be associated with a rising current account surplus (or smaller deficit).

Current accounts do not need to be balanced in every country in every year. At any point in time, countries may offer more investment opportunities than their desired level of saving at a given interest rate can fund, making them net borrowers, resulting in a current account deficit. Other countries may have an excess of saving over desired investment, making them net lenders (a current account surplus). However, in the

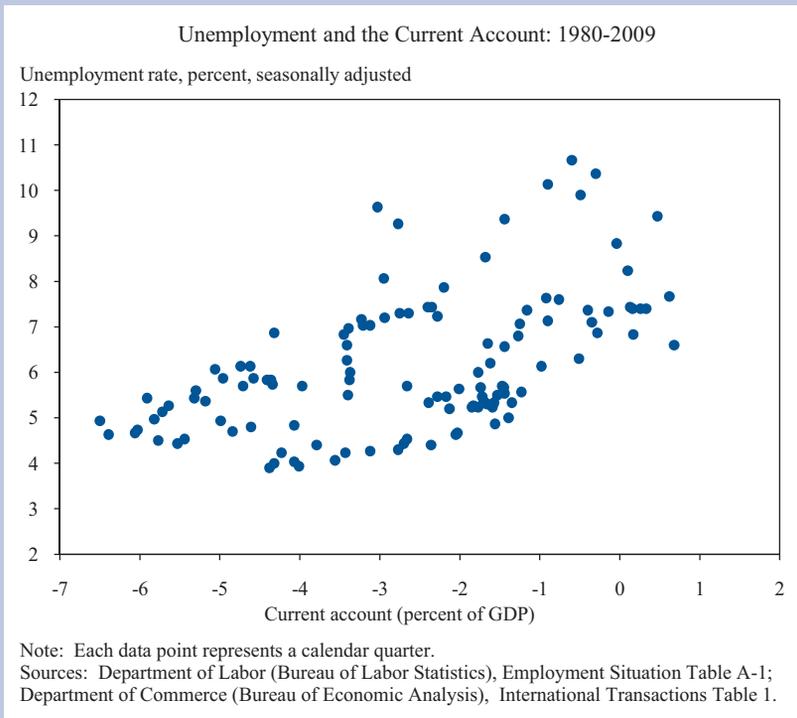
#### **Box 4-1: Unemployment and the Current Account**

The relationship between the level of unemployment and the current account balance is complicated. People frequently argue that imports—and specifically the current account deficit—displace U.S. workers and generate higher unemployment. However, the main determinant of unemployment in the short and medium runs is the state of the business cycle. The scatter plot of the current account and the unemployment rate since 1980, shown in the accompanying figure, displays a positive relationship. Historically, a smaller current account deficit has coincided with a *higher* unemployment rate. Both were being driven by cyclical economic factors: in a recession, the current account balance improved, and unemployment was high. In a boom, the current account balance deteriorated, and unemployment was low. This usual pattern has been at work in the current recession. The U.S. current account deficit narrowed from 6.4 percent of GDP in the third quarter of 2006 to 2.8 percent of GDP in the second quarter of 2009. At the same time, unemployment *rose* from 4.6 percent to 9.3 percent.

The relationship between unemployment and the current account balance can be different in countries that have relied more heavily on exports for growth. For example, in Germany, the unemployment rate fell from 11.7 percent in 2005 to 9.0 percent in 2007 while the current account surplus rose from 5.1 percent of GDP to 7.9 percent. Likewise, in Japan, unemployment fell from 2005 to 2007 as the current account surplus rose. Given the slack in the U.S. economy, a shift toward a current account surplus could increase aggregate demand and help lower the unemployment rate.

*Continued on next page*

Box 4-1, continued



long run, current accounts should tend toward balance, thereby allowing the net foreign investment position (total foreign assets minus total foreign liabilities) of borrowing nations to at least stabilize as a ratio to GDP and possibly to decline over time. Otherwise, creditor nations would be continually increasing the share of their wealth held as assets of debtor nations, and debtor nations would owe a larger and larger share of their production to foreign lenders and capital owners.

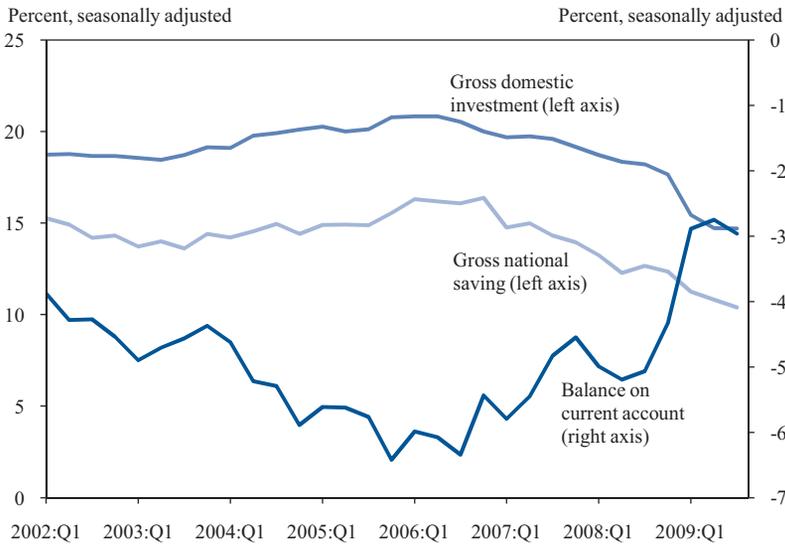
Thus, in the long run, one would expect the U.S. current account to move toward balance. As it does so, it will not cause the absolute level of our accumulated net foreign debt to decline unless the U.S. current account moves into surplus (which is of course possible). But, even if the long-run current account is merely in balance or a small deficit, the previous net foreign borrowing should still decline as a share of GDP as GDP rises. Further, so-called “valuation effects”—changes in asset values of foreign assets held by Americans or U.S. assets owned by foreign investors—also affect the ratio of foreign indebtedness to GDP.

## The Current Account in the Recovery and in the Long Run

As the U.S. economy recovers from the current crisis, it is unlikely to return to current account deficits as large as those in the mid-2000s. Coming out of the 2001–02 recession, investment rose more quickly than saving, and the current account deficit widened to more than 6 percent of GDP (Figure 4-10). Investment had also declined slightly more than saving had before the current crisis hit, and the current account deficit moderated to less than 5 percent of GDP by the third quarter of 2007.<sup>4</sup> The gap narrowed rapidly as investment fell sharply during the crisis. The increase in the personal saving rate since the onset of the crisis has partly offset the large Federal budget deficit (which is negative government saving), so the current account deficit shrank to under 3 percent of GDP.

The specific path of the current account as the economy exits the crisis will depend on whether government and private saving rise ahead of, or along with, a rebound in private investment. But in the long run, the current account deficit is likely to be smaller than it was before the crisis. The likely rise in private and public saving relative to their pre-crisis levels

Figure 4-10  
Saving, Investment, and the Current Account as a Percent of GDP



Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 5.1.

<sup>4</sup> There is also a statistical discrepancy between the saving-minus-investment gap and the current account. While this discrepancy is generally close to zero, it moved from slightly negative to slightly positive in this period, so that the measured current account moved more than the measured gap between saving and investment did.

implies an increase in national saving. Thus, saving is likely to more closely balance domestic investment, suggesting a transition to a smaller current account deficit than in the 2000s. Given that the current account deficit has already narrowed to roughly 3 percent of GDP—less than half its peak—the crucial challenge will be to avoid a reversion to a high-spending, low-saving economy. A successful shift toward a more balanced world growth model generated by increased consumption in nations with current account surpluses could improve net exports even more. This could bring the current account deficit toward its mid-1990s level of roughly 1 to 2 percent of U.S. GDP.

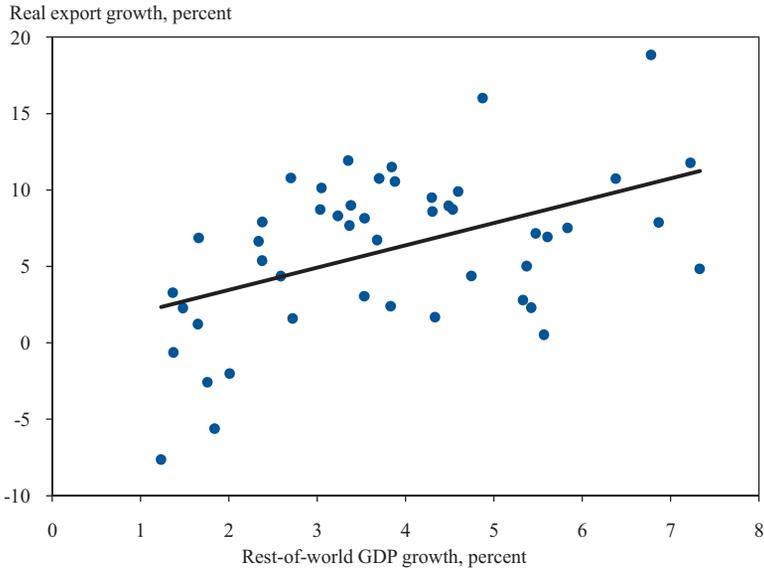
Exports can be expected to rise rapidly as the world economy recovers for a number of reasons. Just as trade typically falls faster than GDP in a recession (discussed in Chapter 3), it typically grows faster during a rebound. Trade-to-GDP ratios have fallen in the last year and can be expected to bounce back as the world economy recovers. This bounce-back alone will lead to rapid export growth. More generally, the crucial driver of exports is always the performance of the world economy. For U.S. goods and services to be bought abroad, demand in other countries must return robustly. This is one reason for the United States to strengthen its ties with fast-growing regions such as emerging East Asia. The faster our trade partners grow and the more we trade with fast-growing economies, the more demand for U.S. exports grows. Figure 4-11 shows the historical relationship between U.S. export growth and growth of non-U.S. world GDP.

The rebalancing of the U.S. economy is likely to be accompanied by a rebalancing of the world economy as well. It is reasonable to expect growth in East Asia to continue at a rapid rate but also to become more oriented toward domestic consumption and investment than it has been in the recent past. Some nations with large current account surpluses took steps to increase domestic demand during the crisis, and these efforts must be maintained and expanded if world growth is to rebalance. It is not a given that such a transition in world demand will take place. Concerted policy action will be needed, but if saving falls in countries with current account surpluses and spending rises, that should stimulate U.S. exports as well as take pressure off of the U.S. consumer as an engine of world growth.

### ***Steps to Encourage Exports***

The Administration is taking many concrete steps to encourage exports. The Trade Promotion Coordinating Committee brings government agencies together to help firms export. While the final decision of whether and how much to export is a market decision made by private businesses, the government can play a constructive role in many ways. The

Figure 4-11  
Growth of U.S. Exports and Rest-of-World Income: 1960-2008



Notes: Rest-of-world GDP constructed as world GDP in constant dollars less U.S. GDP. Data are annual growth rates, 1960-2008. Best-fit linear regression equation is: export growth = 0.5 + 1.5 (GDP growth).  
Sources: World Bank, World Development Indicators; Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.6.

Export-Import Bank can help with financing; consular offices can provide contacts, information, and advocacy; Commerce Department officials can help firms negotiate hurdles; a combination of agencies can help small and mid-sized businesses explore overseas markets. Much of the academic literature in trade models a firm's decision to export as involving a substantial one-time fixed cost (Melitz 2003). The Administration is doing all that it can to lower that initial fixed cost to help expand exports.

In addition, the Administration is pursuing possible trade agreements and making the most of its current trade agreements to expand opportunities for American firms to export. Because U.S. trade barriers are relatively low, new trade agreements often lower barriers abroad more than in the United States, opening new paths for U.S. exports. As the Administration works to expand U.S. market access through a world trade agreement in the Doha round of multilateral trade talks, it continues to explore its options in bilateral free trade agreements and regional frameworks, such as the Trans-Pacific Partnership. The United States Trade Representative continues to work through previously negotiated trade agreements to lower non-tariff trade barriers and facilitate customs issues to make it easier for U.S. businesses to export.

Not all of these developments will necessarily increase net exports (or the current account) of the United States. Since the current account equals net lending to or borrowing from the world, moving the current account balance requires adjustments in saving and investment as well as more opportunities to export. In the long run, increases in demand for U.S. exports resulting from export promotion or reduced trade barriers will generate higher standards of living, but through improved terms of trade, not an increase in net exports. Further, the simple recovery of world trade volumes will increase exports and imports alike. As discussed in Chapter 10, this increase in trade can increase productivity and living standards, but it will not change the current account. However, rapid world growth and declining current account surpluses abroad should lead to an increase in U.S. exports. This can help increase U.S. net exports and hence contribute to the recovery.

As with higher investment, lower current account deficits have important long-run benefits. Lower foreign indebtedness than the country otherwise would have had means reduced interest payments to foreigners. Equivalently, it means that foreigners have on net smaller claims on the output produced in the United States. Thus, lower current account deficits will raise standards of living in the long run.

## CONCLUSION

Economic policy should not aim to return the economy to the path of unstable, unsustainable, unhealthy growth it was on before the wrenching events of the past two years. We should—and can—achieve something better. Growth that is not fueled by unsustainable borrowing, and growth that is based on productive investments, is more stable than the growth of recent decades. And growth that is associated with higher saving will lead to greater accumulation of wealth, and so greater growth in our standards of living.



## C H A P T E R 5

# ADDRESSING THE LONG-RUN FISCAL CHALLENGE

**A**fter several years of budget surpluses, the Federal Government began running consistent, substantial deficits in the 2002 fiscal year. Because the deficits absorbed a significant portion of private saving, they were one reason that the economic expansion of the 2000s was led by consumption and foreign borrowing rather than investment and net exports. More troubling than the deficits of the recent past, however, is the long-term fiscal outlook the Administration inherited. Even before the increased spending necessary to rescue and stabilize the economy, the policy choices of the previous eight years and projected increases in spending on health care and Social Security had already put the government on a path of rising deficits and debt. Thus, a key step in rebalancing the economy and restoring its long-run health must be putting fiscal policy on a sound, sustainable footing.

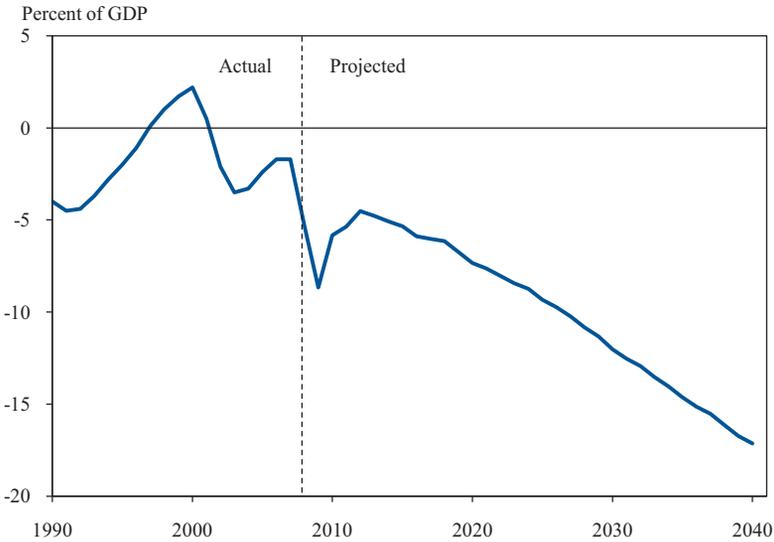
This chapter discusses the fiscal challenges the Administration inherited, the dangers posed by large and growing deficits, and the Administration's measures and plans for addressing these challenges. The Administration and Congress are already taking important steps, most notably through their efforts toward comprehensive health care reform. The legislation currently under consideration addresses rapidly rising health care costs, which are one of the central drivers of the long-run fiscal problem. The fiscal problem is multifaceted, however, and was decades in the making. As a result, no single step can fully address it. Much work remains, and bipartisan cooperation will be essential.

### THE LONG-RUN FISCAL CHALLENGE

When President Obama took office in January 2009, fiscal policy was on a deteriorating course. Figure 5-1 shows the grim outlook for the budget projected by the Congressional Budget Office (CBO) under the assumption

that the policies then in effect would be continued.<sup>1</sup> As the figure makes clear, the budget was on an unsustainable trajectory.

Figure 5-1  
Actual and Projected Budget Surpluses in January 2009 under Previous Policy



Note: CBO baseline surplus projection adjusted for CBO's estimates of costs of continued war spending, continuation of the 2001 and 2003 tax cuts, avoiding scheduled cuts in Medicare's physician payment rates, and holding other discretionary outlays constant as a share of GDP.

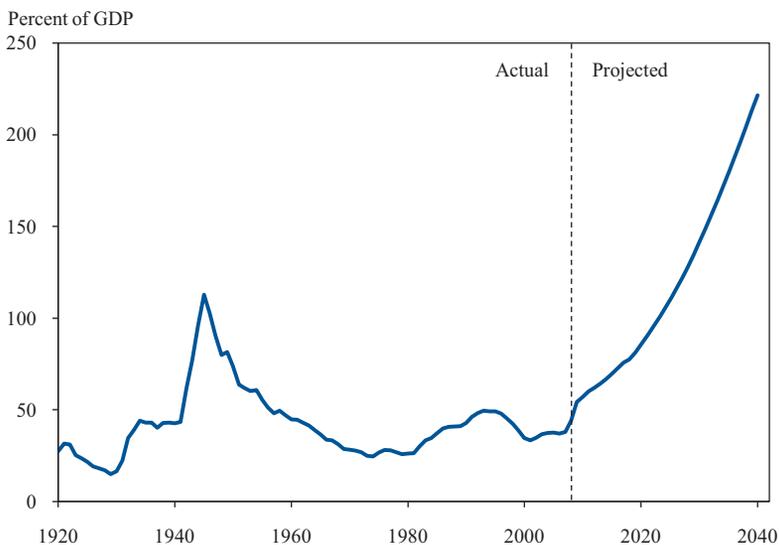
Sources: Congressional Budget Office (2009a, 2009f).

The figure shows that CBO projected that the deficit would be severely affected in the short run by the economic crisis. The decline in output was projected to send tax revenues plummeting and spending for unemployment insurance, nutritional assistance, and other safety net programs soaring. As a result, the deficit was projected to spike to 9 percent of gross domestic product (GDP) in 2009 before falling as the economy recovered. It is natural for revenues to decline and government spending to rise during a recession. Indeed, these movements both mitigate the recession and cushion its impact on ordinary Americans.

<sup>1</sup> This figure presents the CBO January 2009 baseline budget outlook through 2019, adjusted to reflect CBO's estimates of the cost of extending expiring tax provisions including the 2001 and 2003 tax cuts and indexing the Alternative Minimum Tax (AMT) for inflation, reducing the number of troops in Iraq and Afghanistan to 75,000 by 2013, modifying Medicare's "sustainable growth rate" formula to avoid scheduled cuts in physician payment rates, holding other discretionary outlays constant as a share of gross domestic product, and the added interest costs resulting from these adjustments (Congressional Budget Office 2009a). After 2019, the figure presents CBO's June 2009 *Long-Term Budget Outlook* alternative fiscal scenario, which also reflects the costs of continuing these policies (Congressional Budget Office 2009f).

The key message of the figure, however, concerns the path of the deficit after the economy’s projected recovery from the recession. The deficit was projected to fall to close to 4 percent of GDP in 2012 as the economy recovers, but then to reverse course, rising steadily by about 1 percent of GDP every two years. Figure 5-2 shows that if that path were followed, the ratio of the government’s debt to GDP would surpass its level at the end of World War II within 20 years, and would continue growing rapidly thereafter. At some point along such a path, investors would no longer be willing to hold the government’s debt at any reasonable interest rate. Thus, such a path is not feasible indefinitely.

Figure 5-2  
Actual and Projected Government Debt Held by the Public under Previous Policy



Note: CBO baseline projection adjusted for CBO’s estimates of costs of continued war spending, continuation of the 2001 and 2003 tax cuts, avoiding scheduled cuts in Medicare’s physician payment rates, and holding other discretionary outlays constant as a share of GDP. Sources: Congressional Budget Office (2009a, 2009f).

### *Sources of the Long-Run Fiscal Challenge*

The challenging long-run budget outlook the Administration inherited has two primary causes: the policy choices of the previous eight years and projected rising spending on Medicare, Medicaid, and Social Security. The policy choices under the previous administration contribute a substantial amount to the high projected deficits as a share of GDP, while rising spending for health care and Social Security is the main reason the

deficits are projected to balloon over time. Both make large contributions to the difficult fiscal outlook.

The previous policy choices involved both spending and revenues. On the spending side, two decisions were particularly important. One was the failure to pay for the addition of a prescription drug benefit to Medicare, which is estimated to increase annual deficits over the next decade by an average of one-third of a percent of GDP, excluding interest, and more than that in the years thereafter (Congressional Budget Office 2009g; Council of Economic Advisers estimates). The other was the decision to fight two wars without taking any steps to pay for the costs—costs that so far have come close to \$1 trillion. On the revenue side, the most important decisions were those that lowered taxes without making offsetting spending cuts. In particular, the 2001 and 2003 tax cuts have helped push revenues to their lowest level as a fraction of GDP at any point since 1950 (Office of Management and Budget 2010).

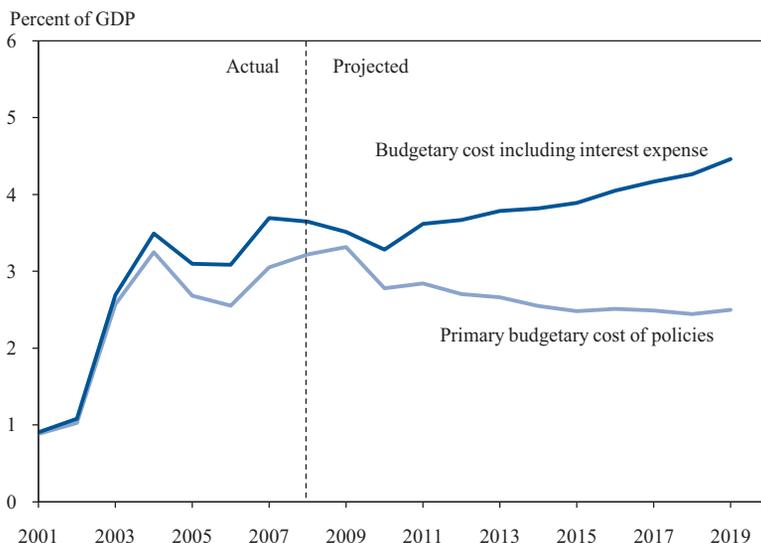
Figure 5-3 shows the impact on the budget deficit of these three major policies of the previous eight years that were not paid for: the 2001 and 2003 tax cuts (including the increased cost of Alternative Minimum Tax relief as a result of those tax cuts), the prescription drug benefit, and the spending for the wars in Iraq and Afghanistan (which for this analysis are assumed to wind down by 2013), both with and without the interest expense of financing these policies.<sup>2</sup> At their peak in 2007 and 2008, these policies worsened the government's fiscal position by almost 4 percent of GDP, and their effect, including interest, rises above 4 percent of GDP into the indefinite future. The fiscal outlook would be far better if these policies had been paid for. Indeed, Auerbach and Gale (2009) conclude that roughly half of the long-run fiscal shortfall in the outlook described earlier results from policy decisions made from 2001 to 2008.

The other main source of the long-run fiscal challenge is rising spending on Medicare, Medicaid, and Social Security. These burdens stem primarily from the rapid escalation of health care costs, combined with the aging of the population. Annual age-adjusted health care costs per Medicare enrollee grew 2.3 percentage points faster than the increase in per capita GDP from 1975 to 2007. If this rate of increase were to continue, Federal spending on Medicare and Medicaid alone would approach 40 percent of the Nation's income in 2085, which is clearly not sustainable

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<sup>2</sup> The figure shows the annual cost (as a percent of GDP) of supplemental military expenditures for operations in Iraq and Afghanistan through 2009 and CBO's estimate of the cost of reducing the number of troops in Iraq and Afghanistan to 75,000 by 2013 thereafter; the cost of the Medicare Part D program net of offsetting receipts and Medicaid savings; the cost of the 2001 and 2003 tax cuts plus the additional cost of AMT relief associated with those tax cuts, as estimated by CBO; and the interest expense of financing these policies.

Figure 5-3  
Budgetary Cost of Previous Administration Policy



Note: Includes supplemental war spending, cost of 2001 and 2003 tax cuts, Medicare Part D net of offsetting receipts and Medicaid savings, and related interest expense.

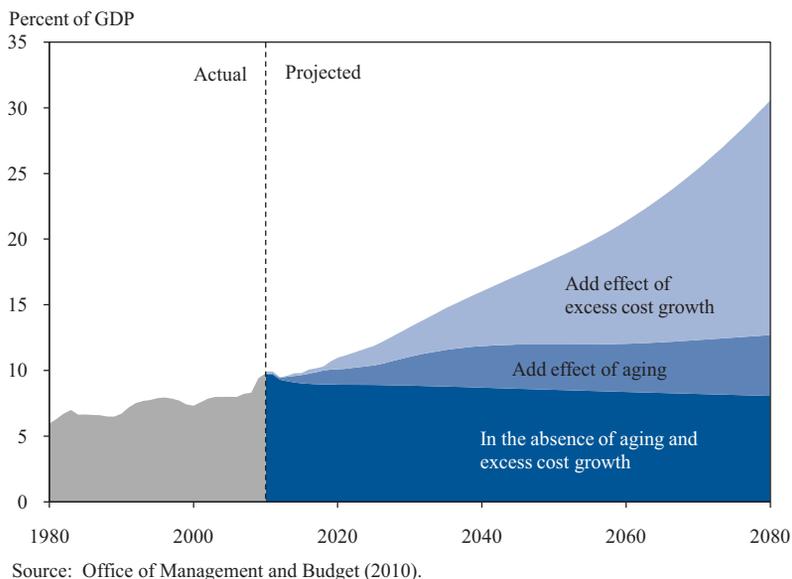
Sources: Belasco (2009); Congressional Budget Office (2009a, 2009g); CEA estimates.

(Congressional Budget Office 2009f). In addition, as a result of decreases in fertility and increases in longevity, the ratio of Social Security and Medicare beneficiaries to workers is rising, straining the financing of these programs.

Figure 5-4 projects the growth in spending in Medicare, Medicaid, and Social Security. Spending on the programs is projected to double as a share of GDP by 2050. Over the next 20 years, demographics—the retirement of the baby boom generation—is the larger cause of rising spending. But throughout, rising health care costs contribute to rising spending, and over the long term, they are by far the larger contributor to the deficit.

Other important factors have also contributed to the increase in entitlement spending. For example, the fraction of non-elderly adults receiving Social Security Disability Insurance (SSDI) benefits has approximately doubled since the mid-1980s, and the fraction of Social Security spending accounted for by SSDI benefits has increased from 10 to 17 percent. Beneficiaries of SSDI are also eligible for health insurance through Medicare. Total cash benefits paid to SSDI recipients were \$106 billion in 2008 and an additional \$63 billion was spent on their health care through Medicare. One contributor to the increase in disability enrollment was a 1984 change in the program’s medical eligibility criteria, which allowed more applicants to qualify for benefits in subsequent years (Autor and Duggan 2006).

Figure 5-4  
Causes of Rising Spending on Medicare, Medicaid, and Social Security



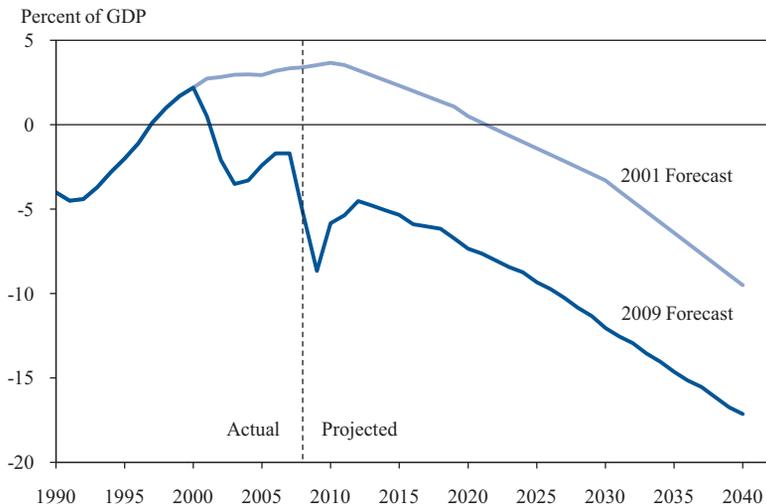
The potential challenges to the budget from these three entitlement programs have been clear for decades. Yet, policymakers in previous administrations did little to address them. For example, in October 2000, CBO warned that spending on Medicare, Medicaid, and Social Security would more than double, rising from 7.5 percent of GDP in 1999 to over 16.7 percent in 2040; nine years later, their forecast for spending on these programs remains virtually unchanged (Congressional Budget Office 2000, 2009f).

All told, the Obama Administration inherited a very different budget outlook from the one left to the previous administration. Figure 5-5 compares the budget forecast in January 2001 (Congressional Budget Office 2001) with the budget outlook in January 2009 described above.<sup>3</sup> In 2001, CBO forecast a relatively bright fiscal future. After a decade of strong growth and responsible fiscal policy, the budget was substantially in surplus, and CBO analysts projected rising surpluses over the next decade, even under their more pessimistic policy alternatives. Rising health care costs would squeeze the budget only over the long term, and the retirement of the baby boom generation was still more than a decade away. The intervening time could have been used to pay off the national debt and accumulate

<sup>3</sup> The 2001 forecast includes the January 2001 baseline forecast adjusted to reflect CBO's estimated cost of holding nondiscretionary outlays constant as a share of nominal GDP. Starting in 2012, the deficit evolves according to the intermediate projection in the October 2000 *Long-Term Budget Outlook* (Congressional Budget Office 2000).

substantial assets in preparation. But policymakers chose a different path. They enacted policies that added trillions to the national debt and doubled the size of the long-run problem. Combined with a deteriorating economic forecast and technical reestimates, the result was a much worse budget outlook in January 2009 than in January 2001.

Figure 5-5  
Budget Comparison: January 2001 and January 2009



Note: CBO 2001 baseline projection adjusted for the cost of holding nondiscretionary outlays constant as a share of nominal GDP; CBO 2009 baseline projection adjusted for costs of continued war spending, continuation of 2001 and 2003 tax cuts, avoiding scheduled cuts in Medicare's physician payment rates, and holding nondiscretionary outlays constant as a share of nominal GDP.

Sources: Congressional Budget Office (2000, 2001, 2009a, 2009f).

### ***The Role of the Recovery Act and Other Rescue Operations***

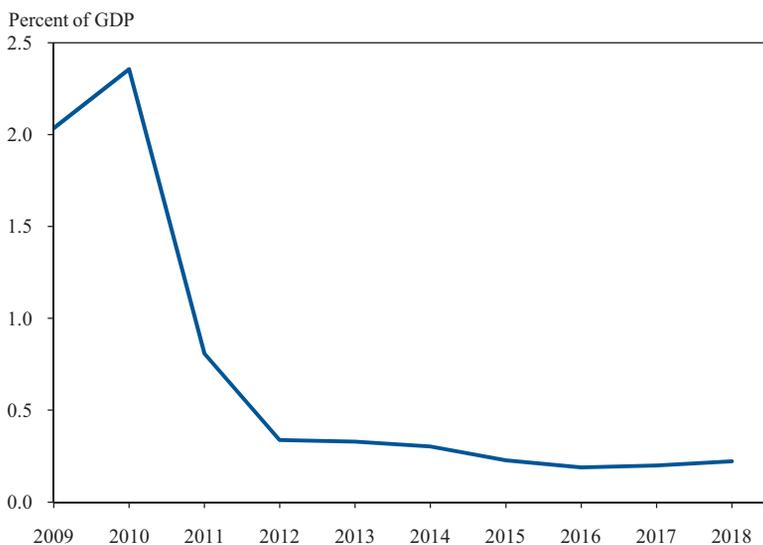
One development that has had an important effect on the short-term budget outlook since January 2009 is the aggressive action the Administration and Congress have taken to combat the recession. By far the most important component of the response in terms of the budget is the American Recovery and Reinvestment Act of 2009. The Recovery Act cuts taxes and increases spending by about 2 percent of GDP in calendar year 2009 and by 2¼ percent of GDP in 2010.

Crucially, however, the budgetary impact of the Recovery Act will fade rapidly. As a result, it is at most a very small part of the long-run fiscal shortfall. By 2012, the tax cuts and spending under the Recovery Act will be less than one-third of 1 percent of GDP. Other rescue measures, such as extensions of programs providing additional support to those most directly

affected by the recession, also contribute to the deficit in the short run. But these programs are much smaller than the Recovery Act. And like the Recovery Act, their budgetary impact will fade quickly.

Figure 5-6 shows the overall budgetary impact of the Recovery Act and other rescue measures, including interest on the additional debt from the higher short-run deficits resulting from the measures. The impact is substantial in 2009 and 2010 but then fades rapidly to about one-quarter of 1 percent of GDP. Moreover, because these estimates do not include the effects of the rescue measures in mitigating the downturn and speeding recovery—and thus raising incomes and tax revenues—they surely overstate the measures' impact on the budget outlook.

Figure 5-6  
Effect of the Recovery Act on the Deficit



Source: Congressional Budget Office (2009b).

## AN ANCHOR FOR FISCAL POLICY

The trajectory for fiscal policy that the Administration inherited, with budget deficits and government debt growing relative to the size of the economy, is clearly untenable. Change is essential. But there are many alternatives to the trajectory the Administration inherited. In thinking about what path fiscal policy should attempt to follow, it is therefore important to examine how deficits affect the economy and what policy paths are feasible.

## *The Effects of Budget Deficits*

Two factors are critical in shaping the economic effects of budget deficits: the state of the economy, and the size and duration of the deficits. Consider first the state of the economy. A central lesson of macroeconomics is that in an economy operating below capacity, higher deficits raise output and employment. Transfer payments (such as unemployment benefits) and tax cuts encourage private consumption and investment spending. Government investments and other purchases contribute to higher output and employment directly and, by raising incomes, also encourage further private spending.

In the current situation, as discussed in Chapter 2, monetary policymakers are constrained because nominal interest rates cannot be lowered below zero, and so they are unlikely to raise interest rates quickly in response to fiscal expansion. As a result, the fiscal expansion attributable to the Recovery Act is likely to increase private investment as well as private consumption and government purchases. Finally, in a precarious environment like the one of the past year, expansionary fiscal policy may make the difference between an economy spiraling into depression and one embarking on a self-sustaining recovery, and so have a dramatic impact on outcomes. As described more fully in Chapter 2, these benefits of fiscal expansion were precisely the motivation for the Administration's pursuit of the Recovery Act and other stimulus policies over the past year.

When the economy is operating at normal capacity, the effects of higher budget deficits are very different. In such a setting, the stimulus from deficits leads not to higher output, but only (perhaps after a delay) to a change in the composition of output. To finance its deficits, the government must borrow money, competing against businesses and individuals seeking to finance new productive investments. As a result, deficits drive up interest rates, discouraging private investment. Hence, deficit spending diverts resources that would otherwise be invested in productive private capital—new business investments in plant, equipment, machinery, and software, or investments in human capital through education and training—into government purchases or private consumption. To the extent that the private investments nonetheless occur but are financed by borrowing from abroad, the country has the benefit of the capital, but at the cost of increased foreign indebtedness. The result is that Americans' claims on future output are lower.

In sum, in normal times, higher budget deficits impede the rebalancing of output toward investment and net exports described in Chapter 4; lower deficits contribute to that rebalancing. In addition, budget

deficits were one source of the “global imbalances” discussed in Chapter 3 that have been implicated by some analysts as part of the cause of the financial and economic crisis. Finally, higher budget deficits and the higher levels of debt they imply may reduce policymakers’ ability to turn to expansionary fiscal policy in the event of a crisis.

Although determining the impact of large budget deficits on capital formation and interest rates is a difficult and contentious issue, the bulk of the evidence points to important effects. For example, several studies find that increases in projected deficits raise interest rates (Wachtel and Young 1987; Engen and Hubbard 2005; Laubach 2009). A careful review concludes that the weight of the evidence indicates that budget deficits raise interest rates moderately (Gale and Orszag 2003). Examining the international evidence, another study reaches a similar conclusion (Ardagna, Caselli, and Lane 2007).

The economic impact of budget deficits depends not only on the condition of the economy but also on their magnitude and persistence. A moderate period of large deficits in a weak economy will speed recovery in the short run and leave the government with only modestly higher debt in the long run. Even in an economy operating at capacity, a temporary period of high deficits is manageable, as the experience of World War II shows compellingly. Once full employment was reached, the high wartime spending surely crowded out investment and thus caused standards of living after the war to be lower than they otherwise would have been. But that cost aside, the enormous temporary deficits that reached 30 percent of GDP at the peak of the war created no long-run problems.

In contrast, the effects of large deficits and debt that grow indefinitely and without bound relative to the size of the economy are very different—and potentially very dangerous. If a government tried to follow such a path, eventually its debt would exceed the amount investors were willing to hold at a reasonable interest rate. At that point, the situation would spiral out of control. Rising interest costs would worsen the fiscal situation; this would further reduce investors’ willingness to hold the government’s debt, raising interest costs further; and so on. Eventually, investors would be unwilling to hold the debt at any interest rate.

### ***Feasible Long-Run Fiscal Policies***

Investors have no qualms about holding some government debt. Indeed, many desire the safety of such an investment. And crucially, in an economy in which private incomes and wealth, as well as the government’s tax base, are growing, the amount of debt investors are willing to hold also

grows. Thus, the key to a sustainable deficit path is a fiscal policy that keeps the level of debt relative to the scale of the economy at levels where investors are willing to hold that debt at a reasonable interest rate. Most obviously, paths where the ratio of the deficit to GDP and the ratio of the debt to GDP grow without bound cannot be sustained. Equally, however, paths that would lead the debt-to-GDP ratio to stabilize, but at an extremely high level, are also not feasible.

Historical and international comparisons, as well as the very favorable terms on which investors are currently willing to lend to the United States, show that the Nation is not close to such problematic levels of indebtedness. In 2007, before the recession, the debt held by the public was 37 percent of nominal GDP. In 2015, because of the direct effects of the recession and, to a lesser extent, the fiscal stimulus, the President’s budget projects the public debt (net of financial assets held by the government) will be 65 percent of GDP. By comparison, it was 113 percent of GDP at the end of World War II; in the United Kingdom, the ratio at the end of World War II was over 250 percent. Table 5-1 shows the projected 2010 government debt-to-GDP ratio (including state and local government debt) for a wide range of developed countries. Japan’s debt-to-GDP ratio is 105 percent, Italy’s is 101 percent, and Belgium’s is 85 percent, and all of these are projected to rise. None of these countries enjoys the same depth and breadth of demand for its debt as the United States does, yet none has difficulty financing its debt. Thus, although it is hard to know the exact U.S. debt-to-GDP ratio that would begin to pose problems, it is clearly well above current levels.

Table 5-1  
Government Debt-to-GDP Ratio in Selected OECD Countries (percent)

	2010
Belgium	85.4
Canada	32.6
France	60.7
Germany	54.7
Italy	100.8
Japan	104.6
Spain	41.6
Sweden	-13.1
United Kingdom	59.0
United States	65.2
Euro-area average	57.9
OECD average	57.6

Note: Numbers include state and local as well as Federal net government debt.

Source: Organisation for Economic Co-operation and Development (2009).

## *The Choice of a Fiscal Anchor*

It is essential that the United States follow a fiscal policy that stabilizes the debt-to-GDP ratio at a feasible level. In thinking about the specific level of that ratio that policymakers should aim for, it is useful to think about the implications that different levels of the budget deficit have for the level of government debt in the long run. In particular, consider paths where the deficit as a percent of GDP stabilizes at some level. If the deficit-to-GDP ratio and the growth rate of nominal GDP are both steady, the debt-to-GDP ratio will settle down to the ratio of the deficit-to-GDP ratio to the growth rate of nominal GDP.<sup>4</sup> For example, if the deficit is 1 percent of GDP and nominal GDP is growing at 5 percent per year, the debt-to-GDP ratio will stabilize at 20 percent. Similarly, if the deficit-to-GDP ratio and the growth rate of nominal GDP are both 4 percent, the debt-to-GDP ratio will stabilize at 100 percent. Instead of thinking about various possible long-run targets for the debt-to-GDP ratio, policymakers can consider possible targets for the deficit-to-GDP ratio and their accompanying implications for the long-run debt-to-GDP ratio.

The choice among different deficit-to-GDP ratios involves tradeoffs. Lower deficits, and thus lower debt in the long run, have obvious advantages: a higher capital stock, lower foreign indebtedness, smaller global imbalances, and more fiscal room to maneuver. But lower deficits have disadvantages as well. They require smaller government programs, higher taxes, or both. Because Medicare, Medicaid, and Social Security will grow faster than GDP in coming decades even after the best efforts to make those programs as efficient as possible, significant cuts in government spending would impose substantial costs. And higher taxes can reduce incentives to work, save, and invest.

Based on these considerations, the Administration believes that an appropriate medium-run goal is to balance the primary budget—the budget excluding interest payments on the debt. Including interest payments, this target will result in total deficits of approximately 3 percent of GDP. With real GDP growth of about 2.5 percent per year and inflation of about

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<sup>4</sup> To see this, consider the case where the deficit-to-GDP ratio equals the growth rate of GDP. Then the dollar amount of debt issued in a year (that is, the deficit) equals the dollar increase in GDP. If the debt-to-GDP ratio is 100 percent—the amount of debt outstanding equals GDP—then the percent increase in debt exactly equals the percent increase in GDP, and the debt-to-GDP ratio holds steady at 100 percent. If, however, the amount of debt outstanding is less than nominal GDP, then adding a dollar to the debt results in a larger percentage increase in the debt than does a dollar added to GDP. Hence, the debt-to-GDP ratio will rise. If the amount of debt outstanding is more than nominal GDP, then the percent increase in debt is smaller than the percent increase in GDP and the debt-to-GDP ratio falls. Thus, the debt-to-GDP ratio converges to the ratio of the deficit-to-GDP ratio to the growth rate of GDP, which in this case is 100 percent.

2 percent per year, nominal GDP growth will be about 4.5 percent per year in the long run. Thus a target for the total deficit-to-GDP ratio of 3 percent implies that the debt-to-GDP ratio will stabilize at less than 70 percent. Because the debt-to-GDP ratio is projected to rise to about 65 percent in a few years, such a target implies that the debt-to-GDP ratio will change little once the economy has recovered from the current recession. A debt-to-GDP ratio of around two-thirds is comfortably within the range of historical and international experience. It represents substantial fiscal discipline relative to the trajectory the Administration inherited. Stabilizing the ratio rather than continuing on a path where it is continually growing is imperative, and stabilizing it at around its post-crisis level has considerable benefits and is a natural focal point.

## REACHING THE FISCAL TARGET

Bringing the primary budget into balance and keeping it there will not be easy. Noninterest spending outstrips tax revenues by a large margin in the budget inherited by the Administration. More importantly, the trajectory of policy implied that spending would continue to exceed revenues even after the economy had recovered and that the deficit would rise steadily for decades to come. The economic developments and policy decisions that put fiscal policy on that course took place over many years. Thus, moving policy back onto a sound path will not happen all at once.

### *General Principles*

In broad terms, the right way to tackle the long-run fiscal problem is not through a sharp, immediate fiscal contraction, but through policies that steadily address the underlying drivers of deficits over time. Large spending cuts or tax increases are exactly the wrong medicine for an economy with high unemployment and considerable unused capacity: just as fiscal stimulus raises income and employment in such an environment, mistimed attempts at fiscal discipline have the opposite effects. Any short-run fiscal contraction can best be tolerated at a time when the Federal Reserve is no longer constrained by the zero bound on nominal interest rates, and so has the tools to counteract any contractionary macroeconomic impacts.

The dangers of a large immediate contraction are powerfully illustrated by America's experience in the Great Depression. In 1937, after four years of very rapid growth but with the economy still far from fully recovered, both fiscal and monetary policy turned sharply contractionary: the veterans' bonus program of the previous year was discontinued, Social Security taxes were collected for the first time, and the Federal Reserve doubled reserve

requirements. The consequences of this premature policy tightening were devastating: real GDP fell by 3 percent in 1938, unemployment spiked from 14 percent to 19 percent, and the strong recovery was cut short.

The impact of actions taken today to gradually bring the long-run sources of the deficit problem under control would be very different. Such policies do not involve a sharp short-run contraction that could derail a nascent recovery. Because the effects cumulate over time, however, they can have a large effect on the long-term fiscal outlook.

Policies that provide gradual but permanent and growing deficit reduction have another potential advantage. By improving the outlook for the long-term performance of the economy, they can improve business and consumer confidence today. As a result, deficit-improving policies whose effects are felt mainly in the future can actually boost the economy in the short run. There is considerable evidence that such “expansionary fiscal contractions” are not just a theoretical possibility (see, for example, Giavazzi and Pagano 1990; Alesina and Perotti 1997; Romer and Romer forthcoming).

In keeping with these general considerations, the Administration is taking actions in three important areas that will have a material impact on the deficit in the medium and long terms.

### ***Comprehensive Health Care Reform***

The first and single most important step toward improving the country’s long-run fiscal prospects is the enactment of comprehensive health care reform that will slow the growth rate of costs. Beyond the obvious importance for Americans’ well-being and economic security, the health reform legislation being considered by Congress would save money. The rapid growth of health care costs is a central source of the country’s fiscal difficulties. CBO has estimated that both the bill passed by the House in November 2009 and the bill passed by the Senate in December 2009 would significantly reduce the deficit over the next decade (Congressional Budget Office 2009e, 2009d). But the more important factor for the long-run fiscal situation is that, as discussed in more detail in Chapter 7, the bills contain crucial measures that experts believe will lead to lower growth in costs while expanding access to coverage, increasing affordability, and improving quality. Given the central role of rising health costs in the long-run deficit projections, these measures would therefore lead to substantial improvements in the budget situation over time.

In November 2009, CBO’s analysis of the Senate health care bill found that “Medicare spending under the bill would increase at an average annual

rate of roughly 6 percent during the next two decades—well below the roughly 8 percent annual growth rate of the past two decades” (Congressional Budget Office 2009c). In December, the Council of Economic Advisers estimated that the fundamental health care reform in the Senate bill would reduce the annual growth rate of Medicare and Medicaid costs by a full percentage point below what it would otherwise be in the coming decade, and by even more in the following decade (Council of Economic Advisers 2009b). These reductions reflect specific measures directed at identifiable sources of wasteful spending and fraud combined with institutional reforms that will help counter the forces leading to excessive cost growth.

Such a reduction in the growth rate of health care costs would have a more profound effect on the long-run fiscal situation of the country than virtually any other fiscal decision being contemplated today. Even if the slowdown in cost growth held steady at 1 percentage point annually rather than rising in the second decade, it would reduce the budget deficit in 2030 by about 2 percent of GDP relative to what it otherwise would be. In today’s terms, this is equivalent to almost \$300 billion per year. Most of these savings reflect the direct impact of lower health care costs on Federal spending. To the extent that health care reform also slows the growth of private sector health insurance costs, which are tax preferred, employees in the private sector will benefit from higher wages and the Treasury from increased revenues; this becomes a second source of budget savings. And these direct savings are magnified by lower interest costs resulting from the reduced debt accumulation in the years preceding 2030 (Council of Economic Advisers 2009a). The need to expand coverage would reduce the overall impact of health care reform on the budget deficit somewhat. However, these costs of expansion would be more than offset even within the coming decade. Thereafter, reform will lower the deficit by increasing amounts over time.

### ***Restoring Balance to the Tax Code***

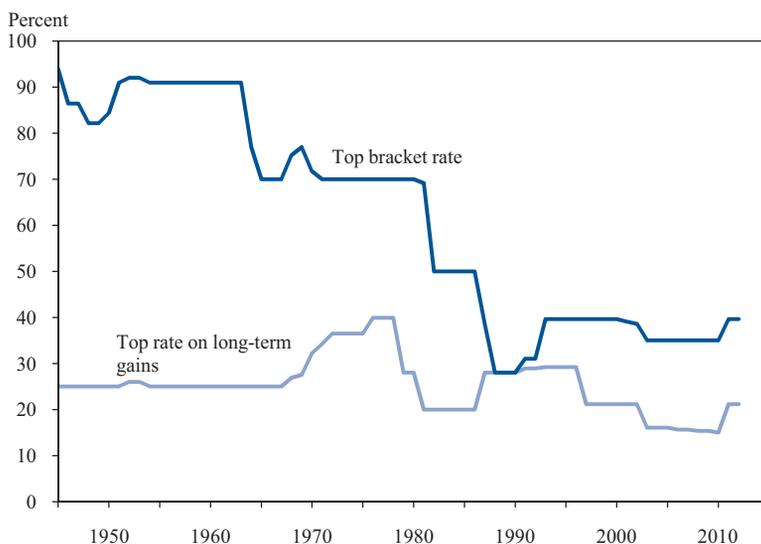
The second major step the Administration is taking to address the long-run fiscal challenge is restoring balance to the tax code that has been lost since 2001. The 2001 and 2003 tax cuts disproportionately favored wealthy taxpayers. According to estimates from the Urban-Brookings Tax Policy Center (2010), in 2010 the 2001 and 2003 tax cuts will increase the after-tax income of the poorest 20 percent of the population by 0.5 percent (about \$51), the middle 20 percent by 2.6 percent (\$1,023), and the top 1 percent by 6.7 percent (\$72,910). About 67 percent of the tax cuts went to the top 20 percent of taxpayers, and 26 percent to the top 1 percent.

These tax cuts for the wealthiest Americans took place when the incomes of ordinary Americans were stagnating and inequality was reaching almost unprecedented levels. In other words, the tax cuts exacerbated the broader trend rather than mitigated it.

The President has consistently maintained that the tax cuts went too far in cutting taxes for people making more than \$250,000 per year and that the country could not afford the tax breaks given to that group over the past eight years. That is why one important plank of his fiscal responsibility framework is to rebalance the tax code, so that it is similar to what existed in the late 1990s for those making more than \$250,000 per year. Specifically, the Administration has proposed letting the marginal tax rates on ordinary income and capital gains for people making more than \$250,000 per year return to the levels they were in 2000. It has also proposed setting the tax rate on dividends for high-income taxpayers to the same 20 percent rate that would apply to capital gains—which is lower than the rate in the 1990s—and letting all other features of the 2001 and 2003 tax cuts expire for these taxpayers. In addition, it has proposed limiting the rate of deductions for high-income taxpayers to 28 percent, so that the wealthy do not obtain proportionately larger benefits from their deductions than other Americans do. None of these changes would take effect until 2011, so they would not affect disposable incomes as the economy recovers in 2010. Nonetheless, they would raise nearly \$1 trillion over the next 10 years and even more over the longer run. Equivalently, they would reduce the budget deficit by more than 0.5 percent of GDP in the medium run and somewhat more over time.

As just discussed, most of these changes would merely bring the tax rates on high-income taxpayers back to their levels in the 1990s. To the extent that some go further, on balance they are more than offset by the fact that some common types of income—dividends, for example—will have rates significantly lower than in the 1990s. Looking at tax policy over U.S. postwar history more broadly shows even more clearly how moderate the proposed changes are. Figure 5-7 shows the top marginal tax rates on ordinary income and capital gains over time and their levels under the Administration's proposals. For ordinary income, a top rate of 39.6 percent, while higher than in the past eight years, is not high compared with the rates that prevailed during most of the past several decades and even during most of the Reagan administration. For capital gains, the 20 percent rate is lower than in many previous periods and is certainly not unusual. And for dividends, the 20 percent rate proposed by the Administration would be lower than under any other modern president save the last.

Figure 5-7  
Top Statutory Tax Rates

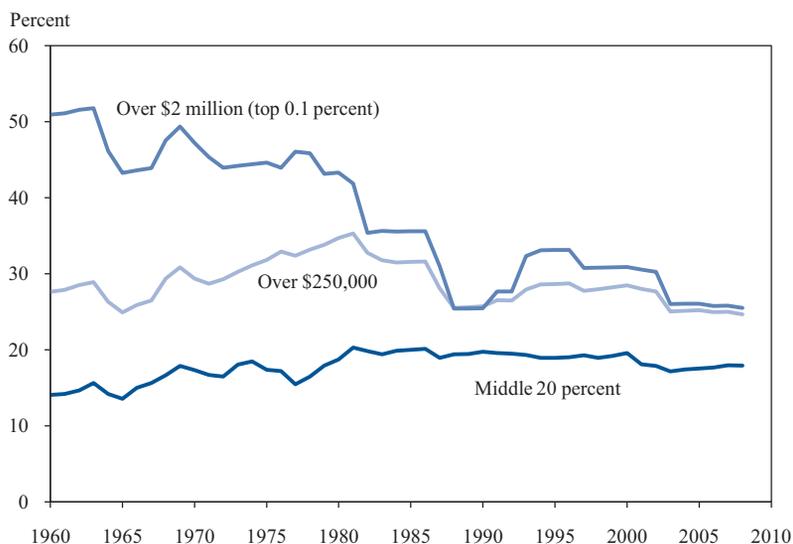


Note: The top rate on qualified dividends is equal to the top bracket rate until 2003; thereafter, it is equal to the top rate on long-term capital gains.  
Source: Department of the Treasury, Internal Revenue Service (2009); Department of the Treasury, Office of Tax Analysis (2010).

Statutory marginal tax rates, however, provide only a partial picture of how the progressivity of the tax system has changed over time. The number of tax brackets has declined and the thresholds at which statutory bracket rates apply have changed; different sources of income, such as capital gains and dividends, are now treated differently in the tax code and taxed at lower rates; and exemption amounts and standard deductions have been adjusted. Moreover, the distribution of income across taxpayers and the composition of taxpayers' sources of income have changed significantly over time, making it difficult to disentangle the effects of statutory changes in the tax system from economic changes. To illustrate the impact of historical statutory tax changes in isolation, Figure 5-8 applies the tax rates for each year from 1960 to 2008 to a sample of taxpayers who filed returns in 2005, after adjusting for average wage growth.<sup>5</sup> The purpose is to show both how current taxpayers

<sup>5</sup> Average tax rates are calculated for nondependent, nonseparated filers with positive adjusted gross income in tax year 2005. Dollar figures are adjusted to the appropriate tax year using the Social Security Administration national average wage index (Social Security Administration 2009), and the tax due is estimated using the National Bureau of Economic Research's TAXSIM tax model. This tax model incorporates the major tax provisions affecting the vast majority of taxpayers and taxable income, and provides estimates of tax liabilities that closely match the historical distribution of taxes actually paid. However, the tax calculation ignores certain small tax provisions and certain accounting changes that broadened the definition of taxable income over time.

Figure 5-8  
Evolution of Average Tax Rates



Notes: Average tax rates calculated each year for a sample of 2005 taxpayers after adjusting for average wage growth. Dollar figures in 2009 dollars.

Sources: Department of the Treasury, Internal Revenue Service, Statistics of Income Public Use File 2005; National Bureau of Economic Research TAXSIM (Feenberg and Coultts 1993); CEA calculations.

would have fared under the tax rates that applied historically and how the tax rates that applied to different income groups have changed over time.

This analysis suggests that the effective tax rates that applied to high-income taxpayers reached their lowest levels in at least half a century in 2008. Under the tax laws that applied from 1960 to the mid-1980s, today’s taxpayers earning more than \$250,000 would have paid an average of around 30 percent of their income in Federal income and payroll taxes, with modest variations from year to year. Moreover, while the tax rates that applied to these “ordinary” rich have fallen considerably, tax rates for the very rich have declined much more. Figure 5-8 shows that taxpayers whose real incomes put them in the top 0.1 percent of taxpayers today—the one-in-a-thousand taxpayers with incomes above about \$2 million in 2009 dollars—would have paid more than 50 percent of their incomes in taxes in the early 1960s.

Average tax rates on high-income groups fell precipitously in the mid-1980s, with the sharp decline in statutory marginal rates. At the same time, the tax rates that would have applied to today’s middle-income taxpayers (the middle 20 percent of taxpayers in 2005, those making between about \$29,500 and \$49,500 per year) increased, on balance, over the last half century. The result is a compression in the tax burdens applied to taxpayers

with different incomes—the difference between the average tax rates on high-income groups and those on middle-class households is narrower than at any other time in modern history. All told, because of legislative changes in the tax code, the after-tax income of the very-high-income group—their disposable income and purchasing power—is more than 50 percent higher than it would have been under historical tax rates and brackets, while that of the middle class is slightly lower.

Under the Administration’s proposals, tax rates on taxpayers earning more than \$250,000 would be very close to the levels that prevailed in the 1990s, leaving statutory tax rates on higher-income taxpayers far below the levels that prevailed until the mid-1980s. The rebalancing of the tax code would not affect middle-class taxpayers—except, of course, to the extent that a better fiscal picture enhances medium- and long-term prospects for economic growth.

The need to restore balance is also evident in our corporate tax system, which encourages businesses to move jobs overseas and to transfer profits to tax havens abroad in order to avoid taxes at home. The Administration’s plan to reform international tax laws would reduce these incentives.

Balance also requires that the largest and most highly levered financial firms reimburse taxpayers for the extraordinary assistance provided to them through the Troubled Asset Relief Program. The President has proposed a modest Financial Crisis Responsibility Fee to ensure that the cost of the financial rescue is not borne by taxpayers. Moreover, the fee would provide a deterrent against the excessive leverage that helped contribute to the crisis.

### *Eliminating Wasteful Spending*

The third step the Administration is taking to confront the long-term deficit is cutting unnecessary spending. The President pledged to eliminate programs that are not working. Last year, the Administration either proposed or enacted cuts to 121 specific programs; these proposed cuts totaled \$17 billion in the first year and hundreds of billions of dollars over the 10-year budget window. They include billions of dollars in terminations of defense programs such as the F-22 fighter aircraft and the new Presidential helicopter, cuts in subsidies for large, high-income agribusinesses, and more than \$40 billion in savings over the next 10 years from eliminating unnecessary subsidies to financial institutions in the private student loan market.

In its fiscal 2011 budget, the Administration is proposing another important measure for spending restraint: a three-year freeze in all non-security discretionary spending starting in 2011. The freeze would be a tough

measure of shared sacrifice. By 2013, it would reduce overall nonsecurity funding by \$30 billion per year relative to current inflation-adjusted funding levels.

The President also strongly supports restoring the pay-as-you-go requirement (PAYGO) that was in place in the 1990s. This law, which requires that lawmakers make the tough choices needed to offset the costs of new nonemergency spending or tax changes, helped move the government budget from deficit to surplus a decade ago. PAYGO is an important tool to force the government to live within its means and move the budget toward fiscal sustainability.

These measures mean that once the temporary rise in government spending necessitated by the economic crisis has ended, spending will be on a lower path than it otherwise would have been. Moreover, both the multi-year freeze and steps to identify additional unnecessary spending each year make the reduction gradual rather than sudden. As a result, the cumulative reduction is substantial, yet there is never a sudden, potentially disruptive drop in spending.

## **CONCLUSION: THE DISTANCE STILL TO GO**

The actions the Administration has taken and is proposing would reduce deficits by more than \$1 trillion over the next 10 years and by even more after that. These actions are significantly bolder steps toward deficit reduction than any taken in decades, and they will face serious opposition by those with vested interests. Even with these actions, however, the primary budget is forecast to remain in deficit in 2015. And the longer-run fiscal problem facing the country still centers on the growth of health care costs and the aging of the population. Thus, barring a substantial and sustained quickening of economic growth above its usual trend rate, further steps will be needed to get the deficit down to the target in the medium and long run.

Regardless of the form they take, these additional steps to reduce the deficit will involve sacrifices by a broad range of groups and significant compromise. Thus, a bipartisan effort will be essential. That is why the President is issuing an executive order creating a bipartisan fiscal commission to report back with a package of measures for additional deficit reduction. The charge to the commission is to propose both medium-term actions to close the gap between noninterest expenditures and tax revenues and additional steps to address the longer-term issues associated with rising health care costs, the aging of the population, and the persistent deficit. The commission's recommendations will form an important foundation on which to base policy decisions moving forward.

The Administration understands that addressing the long-run fiscal challenge will be a long and difficult task requiring commitment and shared sacrifice. But the President also believes that Americans deserve for and expect policymakers to deal with the ever-rising deficit. The changes eventually enacted will be central to the long-run preservation of both America's financial strength and the standards of living of ordinary Americans.



## C H A P T E R 6

# BUILDING A SAFER FINANCIAL SYSTEM

From the ashes of the Great Depression, our leaders built a national system of financial regulation. Before 1933, there was no national regulator for stock and bond markets, no required disclosure by public firms, no national oversight of mutual funds or investment advisors, no insurance for bank depositors, and few restrictions on the activities of banks or other financial institutions. By 1940, landmark legislation had created the Securities and Exchange Commission, the Federal Deposit Insurance Corporation, new and important powers for the Federal Reserve, and disclosure requirements for virtually every major player in financial markets. The pieces of this regulatory structure fit together in a relatively cohesive whole, and the United States enjoyed a long period of relative financial calm. In the 60 years before the Great Depression, our Nation experienced seven episodes of financial panic, in which many banks were forced to shut their windows and declined to redeem deposit accounts. In the nearly 80 years since the Depression, not a single financial crisis has risen to that level.

Although the system of regulation put together during the Depression served us well for many years, warning signs appeared periodically. The savings and loan crisis of the late 1980s and early 1990s showed how banking regulation itself can have unintended consequences. At that time, deregulation coupled with generous deposit insurance combined to create a dangerous pattern of risk-taking that eventually led to a large Federal bailout of the financial system. In 1998, the collapse of Long-Term Capital Management highlighted gaps in the regulatory structure and induced the Federal Reserve Bank of New York to organize an unprecedented private rescue of an unregulated hedge fund. In 2001, the collapse of Enron laid bare the complexity of the financial operations at seemingly nonfinancial corporations and posed new challenges for accountants, policymakers, and analysts. Regulatory changes in the past 30 years responded to the specific weaknesses demonstrated by these crises, but these changes were incremental and lacked

a strategic plan. Throughout this period, the architecture created after the Great Depression was becoming increasingly inadequate to handle ongoing financial innovation. It was in this vacuum that financial innovation accelerated during the first decade of the 21st century.

The weaknesses in our outdated regulatory system nearly drove our economy into a second Great Depression. After the bankruptcy of Lehman Brothers in September 2008, credit markets froze and the Federal Government was forced to embark on increasingly aggressive intervention in financial markets. But as bad as the situation was, it could have been much worse. Courage and creativity during the depths of the crisis, and forceful stewardship by the Administration in the aftermath, have enabled our Nation to escape a second Great Depression. Chapter 2 of this report discusses the major elements of the Administration's recovery plan. This chapter focuses on the long-term changes necessary to prevent future crises.

## WHAT IS FINANCIAL INTERMEDIATION?

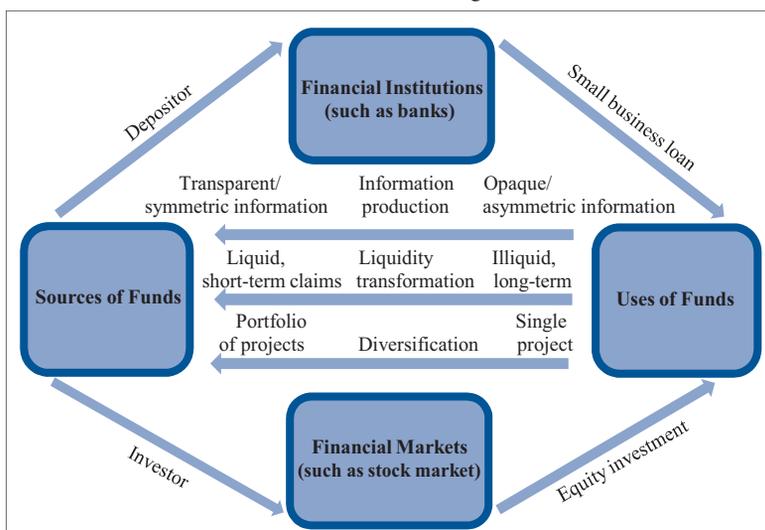
Suppose that the world woke up tomorrow to find all the banks gone, along with insurance companies, investment banks, mutual funds, and all the other institutions where ordinary people put their savings. What would happen? In the short run, people could keep their savings in mattresses and piggy banks, and the only apparent losses would be the forgone interest and dividends. But with no easy way to get the savings from piggy banks into productive investment, the economy would face bigger problems very quickly. Entrepreneurs with ideas would find it difficult to get capital. Large companies in need of money to restructure their operations would have no way to borrow against their future earnings. Young families would have no way to buy a house until they had personally saved enough to afford the whole thing. Our system of financial intermediation makes possible all those activities, and the infrastructure to perform that function is necessarily complex and costly.

### *The Economics of Financial Intermediation*

Figure 6-1 is a simplified diagram of the main function of financial intermediation: transforming savings into investment. The ultimate source of funds is shown on the left: individuals and institutions that have the final claim on wealth and wish to save some of it for the future. The ultimate use of funds is shown on the right: the productive activities that need funds for investment. The middle of the diagram can be classified as "financial intermediation." Financial intermediation uses either markets (like the stock market) or institutions (like a bank) to channel savings into investment.

In each of these cases, financial intermediaries provide three important services: information production, liquidity transformation, and diversification. The paragraphs that follow use a concrete investment example to explain these services and define the terms used in the figure.

Figure 6-1  
Financial Intermediation: Saving into Investment



Suppose that an entrepreneur has an idea for a new company (right side of figure) to develop a new cancer treatment. The science behind this business is specialized and complicated. He could directly approach a wealthy individual with savings (left side of figure) and ask for an investment in his company. The potential investor would immediately face two difficult problems. The first is that she does not know the quality of the entrepreneur’s idea. The entrepreneur is likely to know much more about the science than does the potential investor. Maybe the entrepreneur has already asked more than 100 potential investors and been turned down by all of them. Maybe he knows that the idea has little chance of commercial success but wants to try anyway for humanitarian reasons. The investor knows none of these things and cannot learn about them without putting in real effort. In this case, there would be asymmetric information between the investor and the entrepreneur at the time of the potential investment: economists call this a problem of adverse selection.

The second problem faced by the investor is that, after she makes the investment, she needs some way to monitor the entrepreneur and make sure he is using the money in the most efficient way. Perhaps the entrepreneur

will decide to use the money for some other business or research purpose. How will the investor know? Even worse, what is to prevent the entrepreneur from using the funds for his personal benefit or taking the money without putting in any effort? In this case, there would be additional asymmetric information introduced after the investment was made: economists call this a problem of moral hazard.

To solve these adverse selection and moral hazard problems, the investor will need to expend some resources. She will need to study the technology, evaluate its chances for scientific and commercial success, and then carefully watch over the entrepreneur after the investment is made. These activities are difficult and costly, and there is no reason to believe that a typical source of funds (whose main qualification is that she has money to invest) would also be the best person to solve these problems. One important service of financial intermediation is to efficiently solve the adverse selection and moral hazard problems that come with the transformation of savings into investment. This chapter refers to this service as information production.

The second main service of financial intermediation is liquidity transformation. Consider how long it takes to develop a cancer treatment. In the United States, all new drug treatments must pass through a complex regulatory review stretched over many years. Even if a drug is eventually approved, the path to commercial success can take many more years. Most investors do not want to wait that long to see any return on their money. Individual investors have uncertain liquidity needs—jobs can be lost, family members can get sick—and even institutional investors are subject to performance evaluation over short periods. Overall, investment projects tend to have long production times, while investment sources prefer to have easy access to their money. Somebody, somewhere, must be willing to absorb the liquidity needs of the economy. In practice, these needs are provided by liquidity transformation: financial institutions and markets transform long-term (illiquid) investment projects into short-term (liquid) claims.

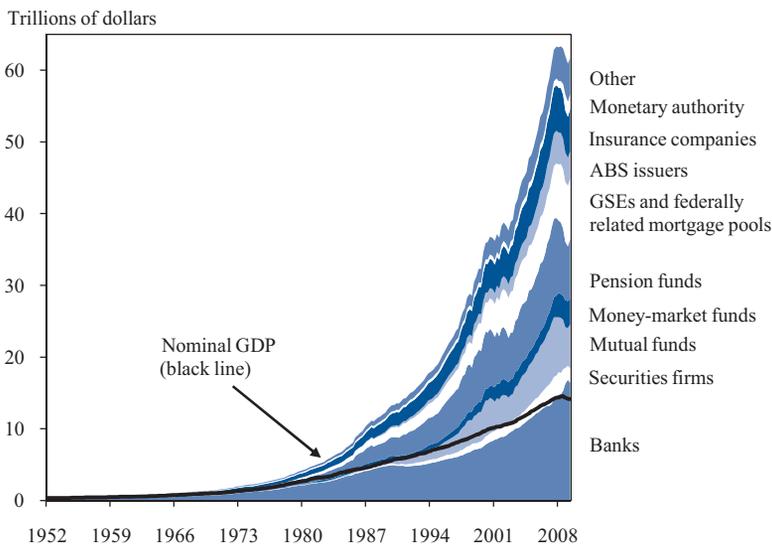
Liquidity transformation is also important for another, more worrisome, reason: it is the main source of the fragility that can lead to a financial crisis. Because most intermediaries have illiquid assets and liquid liabilities, any broad-based attempt by creditors to call liabilities at the same time creates an impossible situation for the intermediary. The classic example is a bank run, where holders of deposits (liquid liabilities) all “run” at the same time to withdraw their funds, leaving banks unable to sell the illiquid business loans and mortgages quickly enough to meet these demands. The same process can occur in a wide variety of nonbank institutions, as is discussed at length later in this chapter.

The third main service of financial intermediation is diversification. A single investment project can be very risky. In the case of the drug company, no investor would want her entire net worth riding on the success of just one technological project. Individual investors can minimize their risk by purchasing a diversified portfolio of investments. If, for example, an investor could pay 1 percent of the costs for 100 different drug-development projects, then her overall portfolio risk would be greatly reduced. Further diversification is achieved by dedicating only a small share of a portfolio to any given industry or country. Such diversification is a main service of most financial institutions, which take funds from many small sources and then invest across a wide variety of projects.

### *Types of Financial Intermediaries*

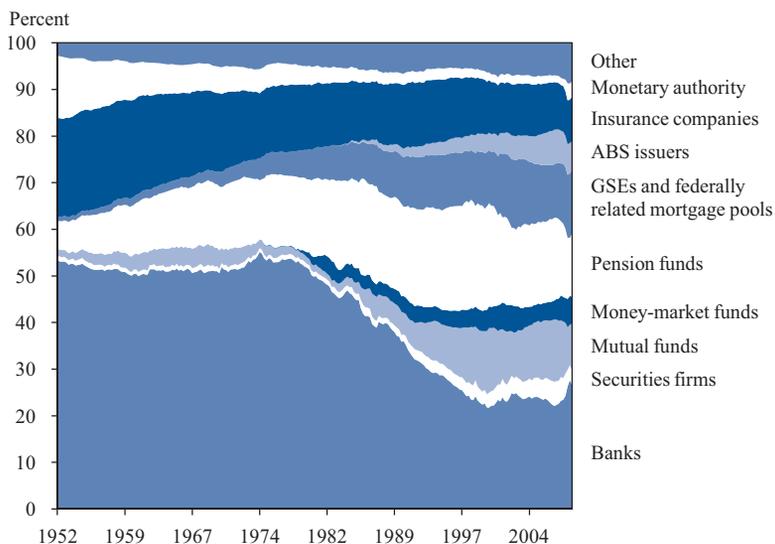
Figure 6-2 plots nominal gross domestic product (GDP) in the United States against the total assets in the financial sector and a long list of institutional types, including banks, securities firms, mutual funds, money-market funds, mortgage pools, asset-backed-securities (ABS) issuers, insurance companies, and pension funds. Figure 6-3 plots the same set of intermediaries, this time as a percentage of the total assets held by the entire financial

Figure 6-2  
Financial Sector Assets



Sources: Federal Reserve Board, Flow of Funds; Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.5.

Figure 6-3  
Share of Financial Sector Assets by Type



Source: Federal Reserve Board, Flow of Funds.

sector. All of these financial data are from the Federal Reserve’s Flow of Funds.

These figures show several important trends. First, assets in the financial sector have grown much faster than GDP: from 1952 to 2009, nominal GDP grew by 4,000 percent and financial sector assets grew by 16,000 percent. This trend is important to remember in considering the regulation of finance. It would be helpful to know if the ratio of financial assets to GDP is “too big” or “too small,” but no good evidence permits such a conclusion. Furthermore, modern developments in the financial system have allowed each dollar of underlying assets to multiply many times across an increasing chain of financial intermediation, so that any measurement of gross assets (as in Figure 6-2) is misleading as a measure of the “importance” of the financial sector. The concept of increasing intermediation chains is discussed later for specific institutional types.

A second important trend is that the assets held by banks grew at approximately the same rate as GDP. Nevertheless, because the overall size of the financial sector has increased, the percentage of financial sector assets held by banks has fallen over time. Third, Figure 6-3 shows the rising share of assets held by mutual funds, government sponsored enterprises (GSEs) and federally related mortgage pools, and issuers of asset-backed securities. Some of this growth can be attributed to the lengthening of the financial intermediation chain, as pension funds delegate asset management to

mutual funds, banks sell mortgages to mortgage pools, and money-market funds purchase securities from these pools.

Three long-standing institutional types are banks, securities firms, and insurance companies. Banks, including commercial banks, bank holding companies, savings institutions (thrifts), and credit unions, are still the largest component of the financial sector, with \$16.5 trillion in assets as of June 2009. Although bank assets represent 26.7 percent of the financial sector, their share has fallen precipitously since 1952, when it was 53.2 percent. Securities firms, also known as investment banks or broker-dealers, had \$2.0 trillion in assets, comprising 3.2 percent of the sector in June 2009. This percentage was down considerably from an average of 5.1 percent in 2007, because most of the largest securities firms went bankrupt, were acquired by banks, or formally converted to banks during the crisis. Insurance companies have \$5.9 trillion in assets, comprising 9.5 percent of the sector as of June 2009.

Mutual funds and pension funds are a second layer of intermediation, often standing in between investors and another institution or market. Mutual funds had \$9.7 trillion in assets, comprising 15.7 percent of the sector, in June 2009, up from only 1.6 percent in 1952 and 3.1 percent in 1980. Mutual funds take money from retail investors and invest in public securities. An important subgroup of mutual funds are money-market funds (MMFs), which are broken out separately in these figures and in the underlying Federal Reserve data. In 1990, MMFs held less than \$500 billion in assets; by June 2009, their total assets were \$3.6 trillion, comprising 5.8 percent of total financial assets. MMFs invest only in relatively safe, short-term assets. Pension funds are a large and growing share of the sector, with assets of \$8.3 trillion making up 13.5 percent of total financial assets in June 2009. Many pension assets are reinvested in mutual funds, so they show up twice in the overall totals. Thus, some of the growth in overall sector assets is driven by this extra step of intermediation.

The next category in Figure 6-2 is GSEs and federally related mortgage pools, with \$8.4 trillion in assets in June 2009. Beginning in the 1930s, various nonbank sources emerged to buy mortgages on the secondary market. By the end of the 1970s, federally related mortgage pools—which include those established by GSEs known as Fannie Mae and Freddie Mac—had almost \$100 billion in assets. The growth of GSEs added an extra layer to the financial intermediation of mortgages. Here, the bank provides a loan to a borrower but then resells this loan to a GSE. The bank may hold debt securities issued by the GSE, and the GSE creates a pool that holds the mortgage.

In addition to those created by GSEs, private mortgage pools, focusing on “subprime” borrowers, have grown substantially in the past 10 years.

These private mortgage pools issue securities backed by the mortgages; these securities, known as mortgage-backed securities (MBSs), are purchased and held by mutual funds or other financial intermediaries. They are one type of an asset-backed security managed by an ABS issuer. ABS issuers do not confine themselves to mortgages; they also pool and securitize auto loans, student loans, credit card debt, and many other types of debt. Twenty years ago, few ABS issuers existed, but by June 2009 they held \$3.8 trillion in assets and comprised 6.2 percent of total financial sector assets.

The remaining categories in Figures 6-2 and 6-3 are the monetary authority (the Federal Reserve) and “other.” As discussed in Chapter 2, the assets of the monetary authority increased rapidly during the crisis, but the increase is expected to be reversed as the Federal Reserve exits from its emergency programs and begins reducing the large stock of long-term securities it had purchased. The “other” category includes special purpose vehicles created to manage the emergency lending programs and various other minor groups of intermediaries.

Hedge funds are an increasingly important financial intermediary, but they are not included in Figures 6-2 and 6-3. Because of a lack of data on domestic hedge funds, the Federal Reserve classifies such funds as part of the household sector and computes the assets of this sector as a residual after everything else is added together and subtracted from total assets. The Federal Reserve is unable to get a clean number for hedge funds because they are largely unregulated private investment pools that are not required to report their holdings to any official source. Unofficial sources estimate the amount of assets held by hedge funds to have been \$1.7 trillion in 2008, but in the absence of regulatory oversight, this estimate is less reliable than the other totals shown in Figure 6-2 (Hedge Fund Research 2009).

## **THE REGULATION OF FINANCIAL INTERMEDIATION IN THE UNITED STATES**

Private institutions and markets should clearly play the central role in financial intermediation. But government also has a role. Economists generally favor government regulation of markets that exhibit a market failure of some kind. This chapter has already discussed two types of market failure: adverse selection and moral hazard. Both can be classified as special cases of asymmetric information, where different parties to a contract do not have the same information. The financial intermediation system alleviates asymmetric-information problems between savers and investors, but information can also be asymmetric between buyers and sellers of financial services. Just as physicians almost always know more than patients about medicine,

and lawyers more than their clients about law, banks and financial advisors should be expected to know more than their investors about investment opportunities. For this reason, there will always be a consumer protection basis for some government regulation of financial services.

Consumer protection was an important motivation for several important pieces of Depression-era legislation. The first two, the Securities Act of 1933 and the Securities Exchange Act of 1934, set forth a long list of requirements for issuing and trading public securities. The list included many types of public disclosure that persist to this day, including information about executive compensation, stockholdings, balance sheets, and income statements. The 1934 Act also created the Securities and Exchange Commission (SEC), the agency responsible for enforcing the new rules. These securities laws were the first Federal laws to regulate organized financial exchanges.

With regulated markets came the growth of intermediaries to service them. These intermediaries gained Federal oversight with the Investment Advisers Act of 1940 (for publicly available investment advisory services) and the Investment Company Act of 1940 (for mutual funds). In total, these four pieces of legislation enacted between 1933 and 1940 represented a huge change in the regulatory structure of financial markets and in most cases can be considered attempts to lessen adverse selection and moral hazard problems between investors, intermediaries, and investments.

Depression-era laws also strengthened the national system of bank regulation, adding new elements to a long pre-Depression history of Federal regulation. Beginning with the National Bank Act of 1864, federally chartered banks have been examined regularly for capital adequacy. State-chartered banks received similar examinations from both state and Federal banking agencies. Such examinations are a form of microprudential regulation, with a focus on the safety and soundness of individual institutions in isolation and with the aim of reducing asymmetric-information problems. Few bank depositors have the time or incentive to conduct detailed reviews of their banks. When regulators conduct periodic reviews and publicize the results, they create a public good of information about the safety and soundness of individual banks. Furthermore, examinations and regulations can constrain excessive risk-taking by federally insured institutions, a moral hazard problem faced by the government, rather than by bank depositors, in part because of deposit insurance.

The microprudential approach, however, is not well suited to handle risks to the entire financial system. The next section of this chapter discusses in detail the spread of crises. For now, it is sufficient to think of a crisis as an occasion when there is a sudden increase in the asymmetric-information problem in the financial system, as can happen after a large economic shock

or the failure of a major bank. The microprudential system of bank examination can alleviate asymmetric-information problems in normal times, but because the government relies on careful periodic examinations, staggered across banks, it does not have the capacity to examine all banks quickly after a shock or to evaluate the risk that a single bank failure will have on other institutions. Faced with a large economic shock, bank customers can rationally fear for the safety of their deposits. Since the upside of leaving one's money at a bank in such a situation is relatively small, but the downside—losing all one's money—is large, it is individually rational for depositors to withdraw their money when uncertainty increases. What is rational for individual depositors, however, puts an impossible strain on the whole banking system, since the liquidity transformation performed by banks cannot be quickly reversed; the illiquid loans and mortgages held by banks cannot immediately be returned to all depositors as cash.

One partial solution to the liquidity problem during banking crises is to create a “lender of last resort.” This lender stands ready to make cash loans to banks that are backed by illiquid collateral: essentially, this lender serves as a new layer of liquidity transformation above the banks. This form of macroprudential policy was the traditional solution to banking crises in Europe in the 19th century but did not come to the United States until the Federal Reserve Act of 1913 created the first version of the Federal Reserve System as a lender of last resort.

But a lender of last resort, by itself, is unable to prevent bank runs across the entire system. Even illiquid collateral must be given a value by the lender—by law the Federal Reserve can only make secured loans—and if the entire system is failing at the same time, there may be no way for a central bank to estimate reasonable valuations quickly enough. A lender of last resort is designed to solve liquidity problems, not solvency problems, but in a severe crisis, these two problems can become inextricably tied together. (This problem arose during the current crisis, when Lehman Brothers was unable to provide enough collateral to qualify for sufficient Federal Reserve loans.) During the Great Depression, some 9,000 bank failures occurred between 1930 and 1933, well above the number of failures in earlier panics. Shortly after taking office in 1933, President Franklin Roosevelt gave his first “fireside chat” and implied a government guarantee for all bank deposits. The Banking Act of 1933 made the guarantee explicit by creating deposit insurance through a new agency, the Federal Deposit Insurance Corporation (FDIC). In the 75 years that followed, the United States averaged fewer than 30 commercial bank failures a year. The FDIC is a crucial piece of macroprudential regulation in that it provides a guarantee to all insured banks, regardless of the condition of any specific bank. Within the account limits

of FDIC insurance, no depositor needs to worry about the soundness of her bank; thus, the FDIC guarantee eliminates most asymmetric-information problems that could lead to bank runs.

A constant tension in macroprudential regulation is that the attempt to prevent bank runs can itself lead to new forms of moral hazard. Because they have deposit insurance, small depositors no longer need to monitor the safety of their banks; therefore, unless regulators are watching carefully, the banks may take excessive risks with no fear of losing deposits. This latent problem was exacerbated during the 1980s by deregulation in the thrift industry. Following this deregulation, thrift institutions began aggressively seeking out deposits by paying ever-higher interest rates and then intermediating these deposits into speculative investments. This strategy allowed thrifts to use FDIC insurance to gamble for solvency, and when the investments failed, a wave of thrift failures swept through Texas, the Midwest, and New England in the 1980s and early 1990s. This wave, now known as the savings and loan crisis, represented the first significant increase in bank failures since the Great Depression. The failures, it should be noted, were not caused by bank runs—they were not driven by a liquidity mismatch between deposits and loans. Deposit insurance remained intact, and no insured deposit lost any money. Rather, the bank failures were caused by the insolvency of the banks, as they gambled and lost with (effectively) government money. Nevertheless, even in the absence of bank runs, many economists believe that the savings and loan crisis contributed to the “credit crunch” and recession of 1990–91.

There has been no fundamental restructuring of the Nation’s financial regulatory system since the Great Depression. All changes since that time have been piecemeal responses to specific events, added individually onto the original superstructure. That regulatory stasis has led to four major gaps in the current system. First, many of the newer financial institutions—hedge funds, mortgage pools, asset-backed-securities issuers—have grown rapidly while being subject to only minimal Federal regulation. These new institutions suffer from many of the asymmetric-information problems that banks faced before the Depression-era reforms. Second, overlapping jurisdictions and mandates have led to regulatory competition between agencies and regulatory “shopping” by institutions. Such competition is yet another form of moral hazard—now centered on the regulators themselves. Third, regulators operate separately in functional silos of banking, insurance, and securities. Many of the largest institutions perform all these activities at once but are not subject to robust consolidated regulation and supervision. And finally, most of the regulatory system is microprudential and focused on the safety and soundness of specific institutions. No regulator is tasked with

taking a macroprudential approach, which attempts to monitor, recognize, and alleviate risks to the financial system as a whole. Such macroprudential regulation would require explicit rules for the orderly resolution of all large financial institutions, not just the banks currently resolved by the FDIC. In short, because of these four gaps, the failure of one institution imposes negative externalities on others, and there is no coherent system for fixing these externalities.

Of the four gaps, the last requires the most urgent reform and the biggest change in regulatory thinking. The financial crisis made clear how rapidly failures can spread across institutions and affect the whole system. A primary challenge of macroprudential regulation is to recognize such “contagion” and categorize and counteract all the different ways it can manifest. The next section of the chapter turns to this task.

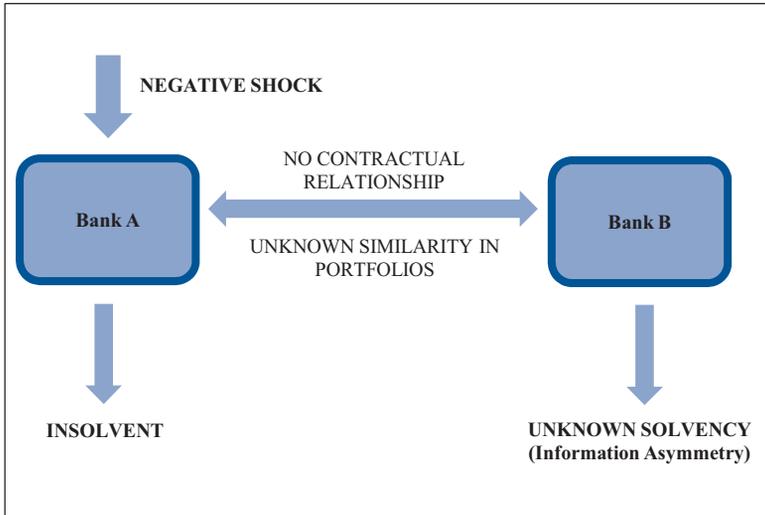
## **FINANCIAL CRISES: THE COLLAPSE OF FINANCIAL INTERMEDIATION**

A financial crisis is a collapse of financial intermediation. In a crisis, the ability of the financial system to move savings into investment is severely impaired. In an extreme crisis, banks close their doors, financial markets shut down, businesses are unable to finance their operations, and households are challenged to find credit. A financial crisis can be triggered by events that are completely external to the financial system. If a large macroeconomic shock hits all banks at the same time, regulators can do little to control the damage. Some crises, however, are triggered or exacerbated by shocks to a small group of institutions that then spread to others. This spread, known as contagion, is a form of negative externality imposed by distressed institutions. The recent financial crisis involved three different types of contagion, referred to in this chapter as confidence contagion, counterparty contagion, and coordination contagion. A macroprudential regulator must have the tools to handle all three.

### ***Confidence Contagion***

The classic example of a “run on the bank” is shown in Figure 6-4. Banks are mostly financed by deposits, which are then lent out as loans to businesses and mortgages for homeowners. A bank’s balance sheet has a maturity mismatch between assets (the loans) and liabilities (the deposits): the loans are long term, with payments coming over many years, while the deposits are short term and can be withdrawn at any time. The liquidity transformation service of the bank works in ordinary times but breaks down if all the depositors ask for their money back at the same time.

Figure 6-4  
Confidence Contagion



Suppose, for example, a depositor in Bank A hears a rumor that other depositors in Bank A are withdrawing their funds. He does not know the explanation. It might be that Bank A has a problem with solvency, that a fair accounting would show that its liabilities exceed its assets. Typically, a depositor does not have the necessary information to form an accurate judgment about solvency. So what does he do? The safe thing, in the absence of deposit insurance, is to go to the bank and take out his money. Perhaps these other depositors know something that he does not. If he waits too long, the bank will be out of cash and unable to redeem his account.

It is easy to see how the run at Bank A could lead to runs at other banks. The public spectacle of long lines of depositors waiting outside a bank is enough to make other banks' customers nervous—the negative externality on confidence. Perhaps Bank A had many real estate loans in some trouble area, and Bank B has an unknown number of similar loans. The issue here is that bank depositors do not want to take the risk of leaving their money in a failing bank. Unlike stock market investors, who expect to take risks and face complicated problems in forecasting the future path of company profits, bank depositors want their money to be safe and do not want to spend an enormous amount of time making sure that it is. The information production service of banks cannot quickly be replaced if the bank is in trouble. Banks, therefore, have historically been subject to runs, and the runs have spread quickly across banks, a phenomenon called confidence contagion.

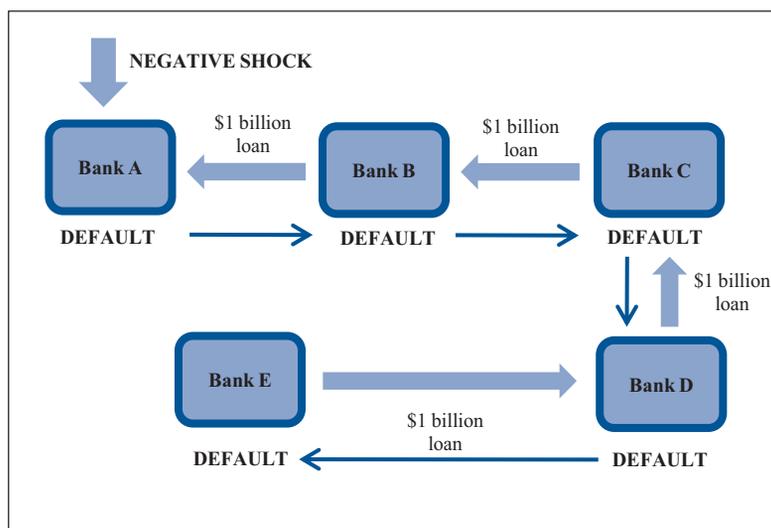
Classic bank runs were commonplace in the United States before (and during) the Great Depression. In the post-FDIC world, bank failure has become a problem of insolvency, not illiquidity. FDIC insurance works almost perfectly up to a current limit of \$250,000 for each account. What happens above this limit? What of the many corporations and investors who want a safe place to put their million-dollar and billion-dollar deposits? In the absence of insured accounts at this level, they choose such alternatives as money-market funds, collateralized short-term loans to financial institutions, and complex derivative transactions. In each of these cases, the effort to find safe, liquid investments can lead to situations that look identical to a classic bank run, but with different players. When a single investment bank (Bear Stearns in March 2008) or money-market fund (the Reserve Fund in September 2008) gets into solvency trouble, confidence can quickly erode at similar institutions. Macroprudential regulation must stop this confidence contagion or, at least, contain it to one segment of the financial system.

### *Counterparty Contagion*

Counterparty contagion is illustrated in Figure 6-5. Here, Bank A owes \$1 billion to Bank B, which owes \$1 billion to Bank C, with this same debt going through the alphabet to Bank E. When Bank A goes out of business owing money to Bank B, then Bank B cannot pay Bank C. To the extent that Bank C lacks the information or the ability to insure against the failure of Bank A, that failure imposes an externality. One failure could lead to defaults all the way to Bank E. Such contagion seems particularly wasteful, because most of it could be averted by getting rid of all the steps in the middle: the only banks here with net exposure are Banks A and E; once the middle is eliminated, all that is left is a \$1 billion debt of A to E.

Derivatives are an important modern vehicle for counterparty chains. A derivative is any security whose value is based completely on the value of one or more reference assets, rates, or indexes. For example, a simple derivative could be constructed as the promise by Party B to pay \$1 to Party A if and only if the stock price of Company XYZ is above \$200 a share on December 31, 2012. This contract is a derivative because its payoff is completely “derived” from the value of XYZ stock; the contract has no meaning that is independent of XYZ stock. Things begin to grow more complicated when Party A and Party B begin to make offsetting trades with other parties, creating counterparty exposures among the group of market participants. For example, Party B, having taken on the risk that XYZ will climb above \$200 a share, may at some point decide to offset this risk by purchasing a similar option from Party C. Eventually, Party C makes the reverse trade with Party D, and soon the chain can extend across the alphabet.

Figure 6-5  
Counterparty Contagion

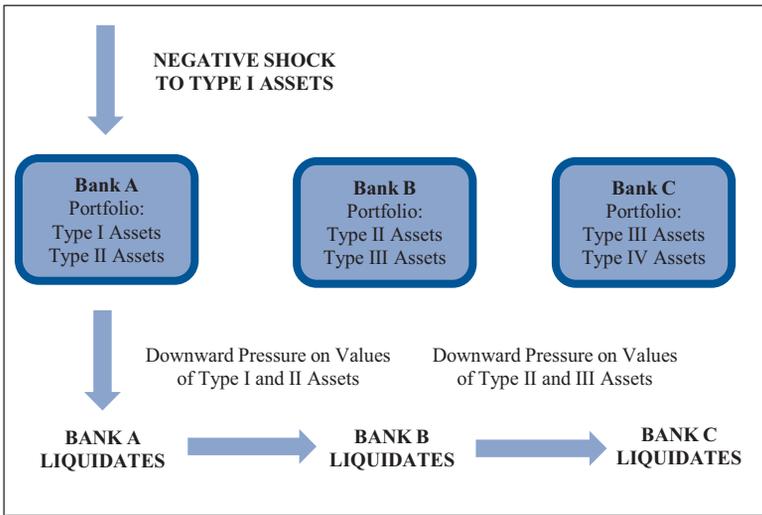


### ***Coordination Contagion***

Coordination contagion is illustrated in Figure 6-6. Here, Bank A owns many assets of Type I and Type II; Bank B owns many assets of Type II and Type III; and Bank C owns many assets of Type III and Type IV. Suppose that a negative shock to the value of Type I assets threatens the solvency of Bank A. In an effort to remain in business, Bank A begins to liquidate its portfolio by selling Type I and Type II assets. As is typical for banks, these underlying assets are relatively illiquid, so it is difficult for Bank A to sell substantial quantities without depressing the price of the assets. As the prices of Type II assets fall, Bank B is in a quandary. The market value of its assets is falling, and the regulators of Bank B may insist that it reduce its leverage or raise more capital. Bank B may then sell Type II and Type III assets to achieve this goal. Again, it is easy to see how this process could flow through the alphabet. Here the process is called coordination contagion because it is driven by the coordinated holdings of the banks, rather than by confidence of investors (in any particular bank) or the chains of contractual relationships (among banks) that lead to counterparty contagion. The externality occurs here only because the underlying assets are illiquid. With this illiquidity, the transactions of each player can significantly affect the price, and the forced sale by one bank harms all the others that own these assets.

Coordination contagion is exacerbated if failing institutions are forced to liquidate their positions quickly. In the fall of 2008, many large financial institutions had significant holdings of subprime housing and other

Figure 6-6  
Coordination Contagion



structured instruments on their balance sheets. With capital scarce and uncertainty about the value of these assets high, distressed institutions faced pressure to sell these assets. If the most desperate institutions sold first, then the depressed prices of these sales would then place pressure on other institutions to mark down the values of these assets on their balance sheets, further exacerbating the problem. One partial solution to this coordination contagion would be to allow the most distressed institutions to exit their positions slowly, so as not to further destabilize the illiquid market for these assets. Such slow exits can be enabled by taking failing institutions into a form of receivership or conservatorship, an enhanced “resolution authority” for nonbank financial institutions that would be analogous to the FDIC process for failing depository institutions.

## PREVENTING FUTURE CRISES: REGULATORY REFORM

The Financial Stability Plan and other policies to address the current crisis described in Chapter 2 have had a positive short-run effect on the financial system. To prevent future crises and achieve long-term stability, however, it will be necessary to fill the gaps in the current regulatory system. The Administration is working closely with Congress to build a regulatory

system for the 21st century.<sup>1</sup> The plan for regulatory reform has five key parts, each covering a different aspect of the financial intermediation system illustrated by Figure 6-1. The parts of the plan are discussed below, with references back to the relevant sections of Figure 6-1.

### ***Promote Robust Supervision and Regulation of Financial Firms***

If the recent financial crisis has proven anything, it is that we have outgrown our Depression-era financial regulatory system. Although most of the largest, most interconnected, and most highly leveraged financial firms were subject to some form of supervision and regulation before the crisis, those forms of oversight proved inadequate and inconsistent. The financial institutions at the top of Figure 6-1 are a varied group that is no longer dominated by traditional commercial banks. A modern regulatory system must account for the entire group.

Three primary weaknesses inherent in the current system led to the crisis. First, capital and liquidity requirements for institutions were simply not high enough. Regulation failed because firms were not required to hold sufficient capital to cover trading assets, high-risk loans, and off-balance-sheet commitments, or to hold increased capital during good times in preparation for bad times. Nor were firms required to plan for liquidity shortages.

Second, various agencies shared responsibility for supervising the consolidated operations of large financial firms. This fragmentation of supervisory responsibility, in addition to loopholes in the legal definition of a “bank,” made it possible for owners of banks and other insured depository institutions to shop for the most lenient regulator.

Finally, other types of financial institutions were subject to insufficient government oversight. Money-market funds were vulnerable to runs, but unlike their banking cousins, they lacked both regulators and insurers. Major investment banks were subject to a regulatory regime through the SEC that is now moot, since large independent investment banks no longer exist. Meanwhile, hedge funds and other private pools of capital operated completely outside the existing supervisory framework.

In combination, these three sets of weaknesses increased the likelihood that some firms would fail and made it less likely that problems at these firms would be detected early. This was a breakdown in the supervision under current authority over individual institutions. But glaring problems were also created by a lack of focus on large, interconnected, and highly leveraged institutions that could inflict harm both on the financial system and on the

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<sup>1</sup> This section is based heavily on the Administration’s white paper on financial reform (Department of the Treasury 2009).

economy if they failed. No regulators were tasked with responsibility for contagion, whether from confidence, counterparties, or coordination.

To solve these problems and ensure the long-term health of the financial system, the government must create a new foundation for the regulation of financial institutions. To do that, the Administration will promote more robust and consistent regulatory standards for all financial institutions. Not only should similar financial institutions face the same supervisory and regulatory standards, but the system can contain no gaps, loopholes, or opportunities for arbitrage.

The Administration has also proposed creating a Financial Services Oversight Council (FSOC). This body, chaired by the Secretary of the Treasury, would facilitate coordination of policy and resolution of disputes and identify emerging risks and gaps in supervision in firms and market activities. The heads of the principal Federal financial regulators would be members of the Council, which would benefit from a permanent staff at the Department of the Treasury.

Finally, the Federal Reserve's current supervisory authority for bank holding companies must evolve along with the financial system. Regardless of whether they own an insured depository institution, all large, interconnected firms whose failure may threaten the stability of the entire system should be subject to consolidated supervision by the Federal Reserve. To that end, the Administration proposes creating a single point of accountability for the consolidated supervision of all companies that own a bank. These firms should not be allowed or able to escape oversight of their risky activities by manipulating their legal structures.

Taken together, these proposals will help reduce the weaknesses in the financial regulatory system by more stringently regulating the largest, most interconnected, and most highly leveraged institutions. In effect, the Administration's proposals would operate on the simple principle that firms that could pose higher risks should be subject to higher standards. Furthermore, both the Federal Reserve and the FSOC would operate through a macroprudential prism and be wary of contagion in all its forms.

### ***Establish Comprehensive Regulation of Financial Markets***

The financial crisis followed a long and remarkable period of growth and innovation in the Nation's financial markets. These new financial markets, found in the bottom part of Figure 6-1, still rely on regulation put together in response to the Great Depression, when stocks and bonds were the main financial products for which there were significant markets. But over time, new financial instruments allowed credit risks to be spread widely, enabling investors to diversify their portfolios in new ways and

allowing banks to shed exposures that once would have had to remain on their balance sheets. As discussed earlier, securitization allowed mortgages and other loans to be aggregated with similar loans, segmented, and sold in tranches to a large and diverse pool of new investors with varied risk preferences. Credit derivatives created a way for banks to transfer much of their credit exposure to third parties without the outright selling of the underlying assets. At the time, this innovation in the distribution of risk was perceived to increase financial stability, promote efficiency, and contribute to a better allocation of resources.

Far from transparently distributing risk, however, the innovations often resulted in opaque and complex risk concentrations. Furthermore, the innovations arose too rapidly for the market's infrastructure, which consists of payment, clearing, and settlement systems, to accommodate them, and for the Nation's financial supervisors to keep up with them. Furthermore, many individual financial institutions' risk management systems failed to keep up. The result was a disastrous buildup of risk in the over-the-counter (OTC) derivatives markets. In the run-up to the crisis, many believed these markets would distribute risk to those most able to bear it. Instead, these markets became a major source of counterparty contagion during the crisis.

In response to these problems, the Administration proposes creating a more coherent and coordinated regulatory framework for the markets for OTC derivatives and asset-backed securities. The Administration's proposal, which aims to improve both transparency and market discipline, would impose record-keeping and reporting requirements on all OTC derivatives. The Administration further proposes strengthening the prudential regulation of all dealers in the OTC derivative markets and requiring all standardized OTC derivative transactions to be executed in regulated and transparent venues and cleared through regulated central counterparties. The primary goal of these regulatory changes is to reduce the possibility of the sort of counterparty contagion seen in the recent crisis. Moving activity to a centralized clearinghouse can effectively break the chain of failures by netting out middleman parties. A successful clearinghouse can reduce the counterparty contagion illustrated in Figure 6-5 to a single debt owned by Bank A to Bank E, thus sparing Banks B, C, and D from the problems.

The Administration has also proposed enhancing the Federal Reserve's authority over market infrastructure to reduce the potential for contagion among financial firms and markets. After all, even a clearinghouse can fail, and regulators must be alert to this danger. Finally, the Administration proposes harmonizing the statutory and regulatory regimes between the futures and securities markets. Although important distinctions exist between the two, many differences in regulation between them are no longer

justifiable. In particular, the growth and innovation in derivatives and derivatives markets have highlighted the need to address gaps and inconsistencies in the regulation of these products by the Commodity Futures Trading Commission (CFTC) and the SEC. In October 2009, the SEC and the CFTC issued a joint report identifying major areas necessary to reconcile their regulatory approaches and outlining a series of regulatory and statutory recommendations to narrow or where possible eliminate those differences.

### ***Provide the Government with the Tools It Needs to Manage Financial Crises***

During the recent crisis, the financial system was strained by the failure or near-failure of some of the largest and most interconnected financial firms. Thanks to lessons learned from past crises, the current system already has strong procedures for handling bank failure. However, when a bank holding company or other nonbank financial firm is in severe distress, it has only two options: obtain outside capital or file for bankruptcy. In a normal economic climate, these options would be suitable and would pose no consequences for broader financial stability. However, during a crisis, distressed institutions may be hard-pressed to raise sufficient private capital. Thus, if a large, interconnected bank holding company or other nonbank financial firm nears failure during a financial crisis, its only two options are untenable: to obtain emergency funding from the U.S. Government, as in the case of AIG; or to file for bankruptcy, as in the case of Lehman Brothers. Neither option manages the resolution of the firm in a manner that limits damage to the broader economy at minimal cost to the taxpayer.

This situation is unacceptable. A way must be found to address the potential failure of a bank holding company or other nonbank financial firm when the stability of the financial system is at risk. To solve this issue, the Administration proposes creating a new authority modeled on the existing authority of the FDIC. The Administration has also proposed that the Federal Reserve Board receive prior written approval from the Secretary of the Treasury for emergency lending under its “unusual and exigent circumstances” authority to improve accountability in the use of other crisis tools. The goal of these proposals is to allow for an orderly resolution of all large institutions—not just banks—so that the coordination contagion depicted in Figure 6-6 does not again threaten the entire financial system. Taking nonbank financial institutions into receivership or conservatorship would make it possible to sell assets slowly and with minimal disruption to the values of similar assets at otherwise healthy institutions.

## ***Raise International Regulatory Standards and Improve International Cooperation***

The system in Figure 6-1 cannot be managed by one country alone, because its interconnections are global. As the recent crisis has illustrated, financial stress can spread quickly and easily across borders. Yet regulation is still set largely in a national context and has failed to effectively adapt. Without consistent supervision and regulation, rational financial institutions will see opportunity in this situation and move their activities to jurisdictions with looser standards. This can create a “race to the bottom” situation.

The United States is addressing this issue by playing a strong leadership role in efforts to coordinate international financial policy through the Group of Twenty (G-20), the G-20’s newly established Financial Stability Board, and the Basel Committee on Banking Supervision. The goal is to promote international initiatives compatible with the domestic regulatory reforms described in this report. These efforts have already borne fruit. In September, the G-20 met in Pittsburgh and agreed in principle to this goal. And while those processes are ongoing, significant progress has been made in agreements strengthening prudential requirements, including capital and liquidity standards; expanding the scope of regulation to nonbank financial institutions, hedge funds, and over-the-counter derivatives markets; and reinforcing international cooperation on the supervision of globally active firms.

## ***Protect Consumers and Investors from Financial Abuse***

Before the financial crisis, numerous Federal and state regulations protected consumers against fraud and promoted understanding of financial products like credit cards and mortgages. But as abusive practices spread, particularly in the subprime and nontraditional mortgage markets, the Nation’s outdated regulatory framework proved inadequate in crucial ways. Although multiple agencies now have authority over consumer protection in financial products, the supervisory framework for enforcing those regulations has significant shortcomings rooted in history. State and Federal banking regulators have a primary mission to promote safe and sound banking practices—placing consumer protection in a subordinate position—while other agencies have a clear mission but limited tools and jurisdiction. In the run-up to the financial crisis, mortgage companies and other firms outside of the purview of bank regulation exploited the lack of clear accountability by selling subprime mortgages that were overly complicated and unsuited to borrowers’ particular financial situations. Banks and

thrifts eventually followed suit, with disastrous results for consumers and the financial system at large.

In 2009, Congress, the Administration, and numerous financial regulators took significant measures to address some of the most obvious inadequacies in the consumer protection framework. One notable achievement was the Credit Card Accountability, Responsibility, and Disclosure Act, signed into law by the President on May 22, 2009. This Act outlaws some of the most unfair and deceptive practices in the credit card industry. For example, it requires that payments be applied to the balances with the highest interest rate first; bans retroactive increases in interest rates for reasons having nothing to do with the cardholder's record with the credit card; prohibits a variety of gimmicks with due dates and "double-cycle fees"; and requires clearer disclosure and ensures consumer choice.

However, given the weaknesses that the recent financial crisis highlighted, it is clear that the consumer protection system needs comprehensive reform across all markets. For that reason the Administration has proposed creating a single regulatory agency, a Consumer Financial Protection Agency (CFPA), with the authority and accountability to make sure that consumer protection regulations are written fairly and enforced vigorously. The CFPA should reduce gaps in Federal supervision and enforcement, improve coordination with the states, set higher standards for financial intermediaries, and promote consistent regulation of similar products.

## CONCLUSION

Our Nation's system of financial intermediation is a powerful engine for economic growth. Productive investment projects are risky, complex to evaluate and monitor, and require long periods of waiting with no returns and illiquid capital. Investors who provide the funds for these projects would be far less willing to do so if they had to absorb all these risks and costs. Bridging the gap between savings and investment requires the efforts of millions of talented professionals collectively performing the services of information production, liquidity transformation, and diversification. In the recent financial crisis this complex system broke down.

To prevent another such crisis from paralyzing our economy, the Administration has embarked on an ambitious plan to modernize the framework of financial regulation. The keystone of the new framework is an emphasis on macroprudential regulation. The regulatory system's past focus on individual institutions served the Nation well for many decades but is now outdated. A modern system that can meet the needs of the 21st century must have the tools to monitor and regulate the interconnections that cause financial crises.



## C H A P T E R 7

# REFORMING HEALTH CARE

In recent years, rising health care costs in the United States have imposed tremendous economic burdens on families, employers, and governments at every level. The number of people without health insurance has also risen steadily, with recent estimates from the Census Bureau indicating that more than 46 million were uninsured in 2008.

With the severe recession exacerbating these problems, Congress and the President worked together during the past year to enact several health care policies to cushion the impact of the economic downturn on individuals and families. For example, just two weeks after taking office, the President signed into law an expansion of the Children's Health Insurance Program (CHIP), which will extend health insurance to nearly 4 million low- and middle-income uninsured children by 2013. Additionally, legislation that increased funding for COBRA (Consolidated Omnibus Budget Reconciliation Act) health insurance coverage allowed many working Americans who lost their jobs to receive subsidized health insurance for themselves and their families, helping to reduce the number of uninsured below what it otherwise would have been.

In late 2009, both the House and the Senate passed major health reform bills, bringing the United States closer to comprehensive health insurance reform than ever before. The legislation would expand insurance coverage to more than 30 million Americans, improve the quality of care and the security of insurance coverage for individuals with insurance, and reduce the growth rate of costs in both the private and public sectors. These reforms would improve the health and economic well-being of tens of millions of Americans, allow employers to pay higher wages to their employees and to hire more workers, and reduce the burden of rising health care costs on Federal, state, and local governments.

## THE CURRENT STATE OF THE U.S. HEALTH CARE SECTOR

Although health outcomes in the United States have improved steadily in recent decades, the U.S. health care sector is beset by rising spending, declining rates of health insurance coverage, and inefficiencies in the delivery of care. In the United States, as in most other developed countries, advances in medical care have contributed to increases in life expectancy and reductions in infant mortality. Yet the unrelenting rise in health care costs in both the private and public sectors has placed a steadily increasing burden on American families, businesses, and governments at all levels.

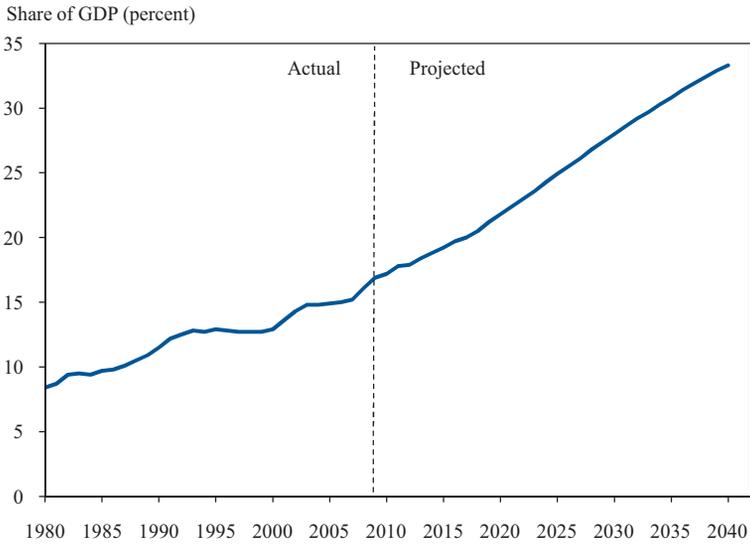
### *Rising Health Spending in the United States*

For the past several decades, health care spending in the United States has consistently risen more rapidly than gross domestic product (GDP). Recent projections suggest that total spending in the U.S. health care sector exceeded \$2.5 trillion in 2009, representing 17.6 percent of GDP (Sisko et al. 2009)—approximately twice its share in 1980 and a substantially greater portion of GDP than that of any other member of the Organisation for Economic Co-Operation and Development (OECD). As shown in Figure 7-1, estimates from the Congressional Budget Office (CBO) in June 2009 projected that this trend would continue in the absence of significant health insurance reform. More specifically, CBO estimated that health care spending would account for one-fourth of GDP by 2025 and one-third by 2040 (Congressional Budget Office 2009d).

The steady growth in health care spending has placed an increasingly heavy financial burden on individuals and families, with a steadily growing share of workers' total compensation going to health care costs. According to the most recent data from the U.S. Census Bureau, inflation-adjusted median household income in the United States declined 4.3 percent from 1999 to 2008 (from \$52,587 to \$50,303), and real weekly median earnings for full-time workers increased just 1.8 percent. During that same period, the real average total cost of employer-sponsored health insurance for a family policy rose by more than 69 percent (Kaiser Family Foundation and Health Research and Educational Trust 2009).

Because firms choose to compensate workers with either wages or benefits such as employer-sponsored health insurance, increasing health care costs tend to “crowd out” increases in wages. Therefore, these rapid

Figure 7-1  
National Health Expenditures as a Share of GDP



Source: Congressional Budget Office (2009d).

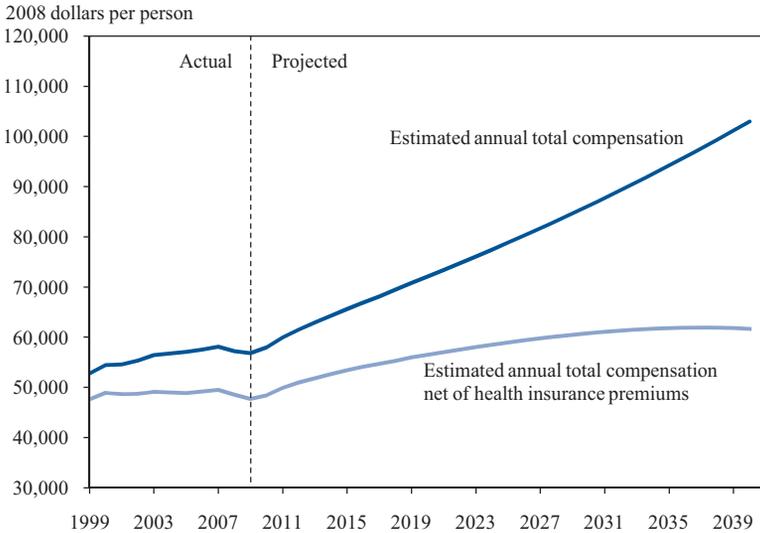
increases in employer-sponsored health insurance premiums have resulted in much lower wage growth for workers.

When considering these divergent trends, it is also important to remember that workers typically pay a significant share of their health insurance premiums out of earnings. According to data from the Kaiser Family Foundation, the average employee share for an employer-sponsored family policy was 27 percent in both 1999 and 2008. In real dollars, the average total family premium increased by \$5,200 during this nine-year period. Thus, the amount paid by the typical worker with employer-sponsored health insurance increased by more than \$1,400 from 1999 to 2008. Subtracting these average employee contributions from median household income in each year gives a rough measure of “post-premium” median household income. By that measure, the decline in household income swells from 4.3 percent to 7.3 percent (that is, post-premium income fell from \$50,566 to \$46,879).

This point is further reinforced when one considers the implications of rapidly rising health care costs for the wage growth of workers in the years ahead. As Figure 7-2 shows, compensation net of health insurance premiums is projected to grow much less rapidly than total compensation,

with the growth eventually turning negative by 2037.<sup>1</sup> Put simply, if health care costs continue to increase at the rate that they have in recent years, workers' take-home wages are likely to grow slowly and eventually decline.

Figure 7-2  
Total Compensation Including and Excluding Health Insurance



Note: Health insurance premiums include the employee- and employer-paid portions.  
Sources: Actual data from Department of Labor (Bureau of Labor Statistics); Kaiser Family Foundation and Health Research and Educational Trust (2009); Department of Health and Human Services (Agency for Healthcare Research and Quality, Center for Financing, Access, and Cost Trends), 2008 Medical Expenditure Panel Survey-Insurance Component. Projections based on CEA calculations.

Rising health care spending has placed similar burdens on the 45 million aged and disabled beneficiaries of the Medicare program, whose inflation-adjusted premiums for Medicare Part B coverage—which covers outpatient costs including physician fees—rose 64 percent (from \$1,411 to \$2,314 per couple per year) between 1999 and 2008. During that same period, average inflation-adjusted Social Security benefits for retired workers grew less than 10 percent. Rising health insurance premiums are thus consuming larger shares of workers' total compensation and Medicare recipients' Social Security benefits alike.

<sup>1</sup> The upper curve of Figure 7-2 displays historical annual compensation per worker in the nonfarm business sector in constant 2008 dollars from 1999 through 2009, deflated with the CPI-U-RS. Real compensation per worker is projected using the Administration's forecast from 2009 through 2020 and at a 1.8 percent annual rate in the subsequent years. The lower curve plots historical real annual compensation per person net of average total premiums for employer-sponsored health insurance during the same period. The assumed growth rate of employer-sponsored premiums is 5 percent, which is slightly lower than the average annual rate as reported by the Kaiser Family Foundation during the 1999 to 2009 period.

The corrosive effects of rising health insurance premiums have not been limited to businesses and individuals. Increases in outlays for programs such as Medicare and Medicaid and rising expenditures for uncompensated care caused by increasing numbers of uninsured Americans have also strained the budgets of Federal, state, and local governments. The fraction of Federal spending devoted to health care rose from 11.1 percent in 1980 to 25.2 percent in 2008. In the absence of reform, this trend is projected to continue, resulting in lower spending on other programs, higher taxes, or increases in the Federal deficit.

The upward trend in health care spending has also posed problems for state governments, with spending on the means-tested Medicaid program now the second largest category of outlays in their budgets, just behind elementary and secondary education. Because virtually all state governments must balance their budgets each year, the rapid increases in Medicaid spending have forced lawmakers to decide whether to cut spending in areas such as public safety and education or to increase taxes.

If health care costs continue rising, the consequences for government budgets at the local, state, and Federal level could be dire. And as discussed in Chapter 5, projected increases in the costs of the Medicare and Medicaid programs are a key source of the Federal Government's long-term fiscal challenges.

### ***Market Failures in the Current U.S. Health Care System: Theoretical Background***

As described by Nobel Laureate Kenneth Arrow in a seminal 1963 paper, an individual's choice to purchase health insurance is rooted in the economics of risk and uncertainty. Over their lifetimes, people face substantial risks from events that are largely beyond their control. When possible, those who are risk-averse prefer to hedge against these risks by purchasing insurance (Arrow 1963).

Health care is no exception. When people become sick, they face potentially debilitating medical bills and often must stop working and forgo earnings. Moreover, medical expenses are not equally distributed: annual medical costs for most people are relatively small, but some people face ruinously large costs. Although total health care costs for the median respondent in the 2007 Medical Expenditure Panel Survey were less than \$1,100, costs for those at the 90th percentile of the distribution were almost 14 times higher (Department of Health and Human Services 2009). As a result, risk-averse people prefer to trade an uncertain stream of expenses for medical care for the certainty of a regular insurance payment, which buys a policy that pays for the high cost of treatment during illness or injury. Economic theory and

common sense suggest that purchasing health insurance to hedge the risk associated with the economic costs of poor health makes people better off.

Health insurance markets, however, do not function perfectly. The economics literature documents four primary impediments: adverse selection, moral hazard, the Samaritan's dilemma, and problems arising from incomplete insurance contracts. In a health insurance market characterized by these and other sources of inefficiency, well-designed government policy has the potential to reduce costs, improve efficiency, and benefit patients by stabilizing risk pools for insurance coverage and providing needed coverage to those who otherwise could not afford it.

**Adverse Selection.** In the case of adverse selection, buyers and sellers have asymmetric information about the characteristics of market participants. People with larger health risks want to buy more generous insurance, while those with smaller health risks want lower premiums for coverage. Insurers cannot perfectly determine whether a potential purchaser is a large or small health risk.

To understand how adverse selection can harm insurance markets, suppose that a group of individuals is given a choice to buy health insurance or pay for medical costs out-of-pocket. The insurance rates for the group will depend on the average cost of health care for those who elect to purchase insurance. The healthiest members of the group may decide that the insurance is too expensive, given their expected costs. If they choose not to get insurance, the average cost of care for those who purchase insurance will increase. As premiums increase, more and more healthy individuals may choose to leave the insurance market, further increasing average health care costs for those who purchase insurance. Over time, this winnowing process can lead to declining insurance rates and even an unraveling of health insurance markets. Without changes to the structure of insurance markets, the markets can break down, and fewer people can receive insurance than would be optimal. Subsidies to encourage individuals to purchase health insurance can help combat adverse selection, as can regulations requiring that individuals purchase insurance, because both ensure that healthier people enter the risk pool along with their less healthy counterparts.

Under current institutional arrangements, adverse selection is likely to be an especially large problem for small businesses and for people purchasing insurance in the individual market. In large firms, where employees are generally hired for reasons unrelated to their health, high- and low-risk employees are automatically pooled together, reducing the probability of low-risk employees opting out of coverage or high-risk workers facing extremely high premiums. In contrast, small employers cannot pool risk across a large group of workers, and thus the average risk

of a given small firm's employee pool can be significantly above or below the population average. As such, similar to the market for individual insurance described above, firms with low-risk worker pools will tend to opt out of insurance coverage, leaving firms with high-risk pools to pay much higher premiums.

**Moral Hazard.** A second problem with health insurance is moral hazard: the tendency for some people to use more health care because they are insulated from its price. When individuals purchase insurance, they no longer pay the full cost of their medical care. As a result, insurance may induce some people to consume health care on which they place much less value than the actual cost of this care or discourage patients and their doctors from choosing the most efficient treatment. This extra consumption could increase average medical costs and, ultimately, insurance premiums. The presence of moral hazard suggests that research into which treatments deliver the greatest health benefits could encourage doctors and patients to adopt best practices.

**Samaritan's Dilemma.** A third source of inefficiency in the insurance market is that society's desire to treat all patients, even those who do not have insurance and cannot pay for their care, gives rise to the Samaritan's dilemma. Because governments and their citizens naturally wish to provide care for those who need it, people who lack insurance and cannot pay for medical care can still receive some care when they fall ill. Some people may even choose not to purchase insurance because they understand that emergency care may still be available to them. In the context of adverse selection, a low insurance rate is a *symptom* of underlying inefficiencies. Viewed through the lens of the Samaritan's dilemma, in contrast, the millions of uninsured Americans are one *source* of health care inefficiencies.

The burden of paying for some of this uncompensated care is passed on to people who do purchase insurance. The result is a "hidden tax" on health insurance premiums, which in turn exacerbates adverse selection by raising premiums for individuals who do not opt out of coverage. One estimate suggests that the total amount of uncompensated care for the uninsured was approximately \$56 billion in 2008 (Hadley et al. 2008).

**Incomplete Insurance Contracts.** Many economic transactions involve a single, straightforward interaction between a buyer and a seller. In many purchases of goods, for example, the prospective buyer can look the good over carefully, decide whether or not to purchase it, and never interact with the seller again. Health insurance, in contrast, involves a complex relationship between an insurance company and a patient that can last years or even decades. It is not possible to foresee and spell out in detail every contingency that may arise and what is and is not covered.

When individuals are healthy, their medical costs are typically lower than their premiums, and these patients are profitable for insurance companies. When patients become ill, however, they may no longer be profitable. Insurance companies therefore have a financial incentive to find ways to deny care or drop coverage when individuals become sick, undermining the central purpose of insurance. For example, in most states, insurance companies can rescind coverage if individuals fail to list any medical conditions—even those they know nothing about—on their initial health status questionnaire. Entire families can lose vital health insurance coverage in this manner. A House committee investigation found that three large insurers rescinded nearly 20,000 policies over a five-year period, saving these companies \$300 million that would otherwise have been paid out as claims (Waxman and Barton 2009).

A closely related problem is that insurance companies are reluctant to accept patients who may have high costs in the future. As a result, individuals with preexisting conditions find obtaining health insurance extremely expensive, regardless of whether the conditions are costly today. This is a major problem in the individual market for health insurance. Forty-four states now permit insurance companies to deny coverage, charge inflated premiums, or refuse to cover whole categories of illnesses because of preexisting medical conditions. A recent survey found that 36 percent of non-elderly adults attempting to purchase insurance in the individual market in the previous three years faced higher premiums or denial of coverage because of preexisting conditions (Doty et al. 2009). In another survey, 1 in 10 people with cancer said they could not obtain health coverage, and 6 percent said they lost their coverage because of being diagnosed with the disease (USA Today, Kaiser Family Foundation, and Harvard School of Public Health 2006). And the problem affects not only people with serious medical conditions, but also young and healthy people with relatively minor conditions such as allergies or asthma.

### ***System-Wide Evidence of Inefficient Spending***

While an extensive literature in economic theory makes the case for market failure in the provision of health insurance, a substantial body of evidence documents the pervasiveness of inefficient allocation of spending and resources throughout the health care system. Evidence that health care spending may be inefficient comes from analyses of the relationship between health care spending and health outcomes, both across states in our own Nation and across countries around the world.

Within the United States, research suggests that the substantially higher rates of health care utilization in some geographic areas are not

associated with better health outcomes, even after accounting for differences in medical care prices, patient demographics, and regional rates of illness (Wennberg, Fisher, and Skinner 2002). Evidence from Medicare reveals that spending per enrollee varies widely across regions, without being clearly linked to differences in either medical needs or outcomes. One comparison of composite quality scores for medical centers and average spending per Medicare beneficiary found that facilities in states with low average costs are as likely or even more likely to provide recommended care for some common health problems than are similar facilities in states with high costs (Congressional Budget Office 2008). One study suggests that nearly 30 percent of Medicare’s costs could be saved if Medicare per capita spending in all regions were equal to that in the lowest-cost areas (Wennberg, Fisher, and Skinner 2002).

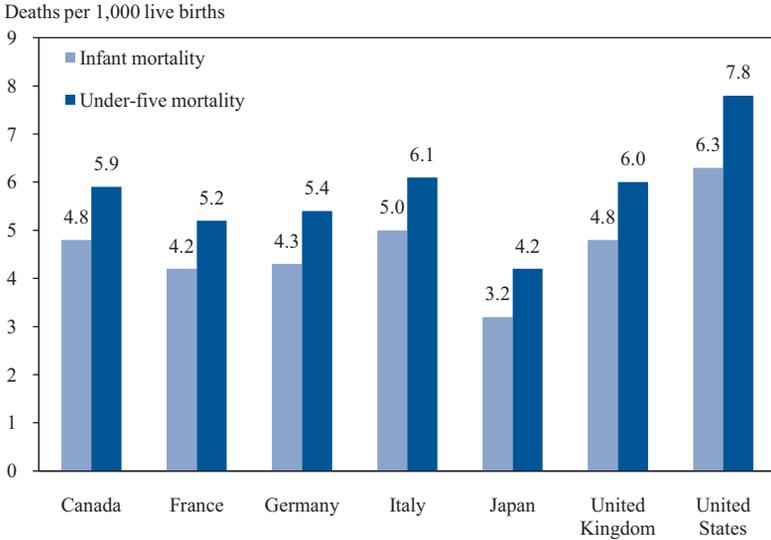
Variations in spending tend to be more dramatic in cases where medical experts are uncertain about the best kind of treatment to administer. For instance, in the absence of medical consensus over the best use of imaging and diagnostic testing for heart attacks, use rates vary widely geographically, leading to corresponding variation in health spending. Research that helps medical providers understand and use the most effective treatment can help reduce this uncertainty, lower costs, and improve health outcomes.

Overuse of “supply-sensitive services,” such as specialist care, diagnostic tests, and admissions to intensive care facilities among patients with chronic illnesses, as well as differences in social norms among local physicians, seems to drive up per capita spending in high-cost areas (Congressional Budget Office 2008). Moral hazard may help to explain some of the overuse of services that do not improve people’s health status.

Health care spending also differs as a share of GDP across countries, without corresponding systematic differences in outcomes. For example, according to the United Nations, the estimated U.S. infant mortality rate of 6.3 per 1,000 infants for the 2005 to 2010 period is projected to be substantially higher than that in any other Group of Seven (G-7) country, as is the mortality rate among children under the age of five, as shown in Figure 7-3 (United Nations 2007). This variation is especially striking when one considers that the United States has the highest GDP per capita of any G-7 country. Although drawing direct conclusions from cross-country comparisons is difficult because of underlying health differences, this comparison further suggests that the United States could lower health care spending without sacrificing quality. Similarly, life expectancy is much lower in the United States than in other advanced economies. The OECD estimated life expectancy at birth in 2006 to be 78.1 years in the United States

compared with an average of 80.7 in other G-7 countries (Organisation for Economic Co-operation and Development 2009).

Figure 7-3  
Child and Infant Mortality Across G-7 Countries



Source: United Nations (2007).

Recent research suggests that differences in health care systems account for at least part of these cross-country differences in life expectancy. For example, one study (Nolte and McKee 2008) analyzed mortality from causes that could be prevented by effective health care, which the authors term “amenable mortality.” They found that the amenable mortality rate among men in the United States in 1997–98 was 8 percent higher than the average rate in 18 other industrialized countries. The corresponding rate among U.S. women was 17 percent higher than the average among these other 18 countries. Moreover, of all 19 countries considered, the United States had the smallest decline during the subsequent five years, with a decline of just 4 percent compared with an average decline of 16 percent across the remaining 18. The authors further estimated that if the U.S. improvement had been equal to the average improvement for the other countries, the number of preventable deaths in the United States would have been 75,000 lower in 2002. This finding suggests that the U.S. health care system has been improving much less rapidly than the systems in other industrialized countries in recent years.

A further indication that our health care system is in need of reform is that satisfaction with care has, if anything, been declining despite the substantial increases in spending. Not surprisingly, this decline in satisfaction has been concentrated among people without health insurance, whose ranks have swelled considerably during the past decade. For example, from 2000 to 2009, the fraction of uninsured U.S. residents reporting that they were satisfied with their health care fell from 36 to 26 percent. And not only has dissatisfaction with our health care system increased over time, it is also noticeably greater than dissatisfaction with systems in many other developed nations (Commonwealth Fund 2008).

### ***Declining Coverage and Strains on Particular Groups and Sectors***

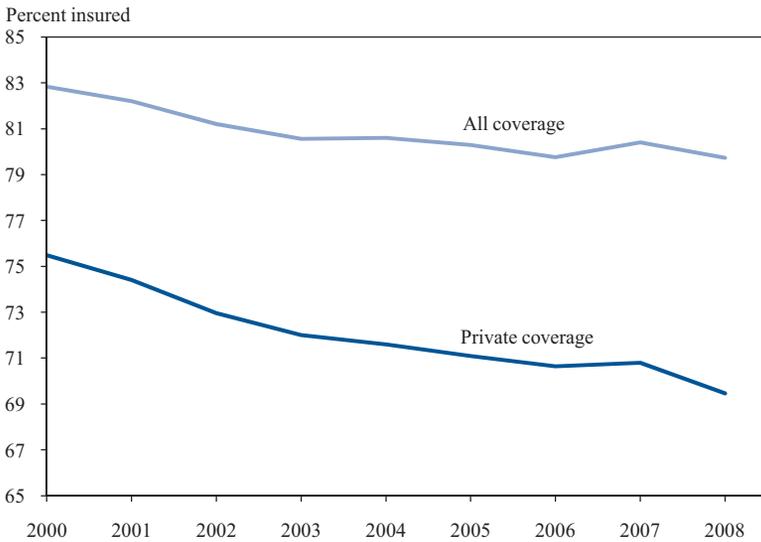
The preceding analysis shows that at an aggregate level, there are major inefficiencies in the current health care system. But, because of the nature of the market failures in health care, the current system works particularly poorly in certain parts of the economy and places disproportionate burdens on certain groups. Moreover, because of rising costs, many of the strains are increasing over time.

***Declining Coverage among Non-Elderly Adults.*** The rapid increase in health insurance premiums in recent years has caused many firms to stop offering health insurance to their workers, forcing employees either to pay higher prices for coverage in the individual market (which is often much less generous than coverage in the group market) or to go without health insurance entirely. According to the Kaiser Family Foundation, between 2000 and 2009, the share of firms offering health insurance to their workers fell from 69 to 60 percent. Furthermore, 8 percent of firms offering coverage in 2009 reported that they were somewhat or very likely to drop coverage in 2010.

Largely because of these falling offer rates, private health insurance coverage declined substantially during this same period. As shown in Figure 7-4, the fraction of non-elderly adults in the United States with private health insurance coverage fell from 75.5 percent in 2000 to 69.5 percent in 2008.

These numbers, however, provide just a snapshot of health insurance coverage in the United States because they measure the fraction of people who are uninsured at a point in time and thus obscure the fact that a large fraction of the population has been uninsured at some point in the past. According to recent research, at least 48 percent of non-elderly Americans were uninsured at some point between 1996 and 2006 (Department of the Treasury 2009).

Figure 7-4  
Insurance Rates of Non-Elderly Adults



Source: DeNavas-Walt, Proctor, and Smith (2009).

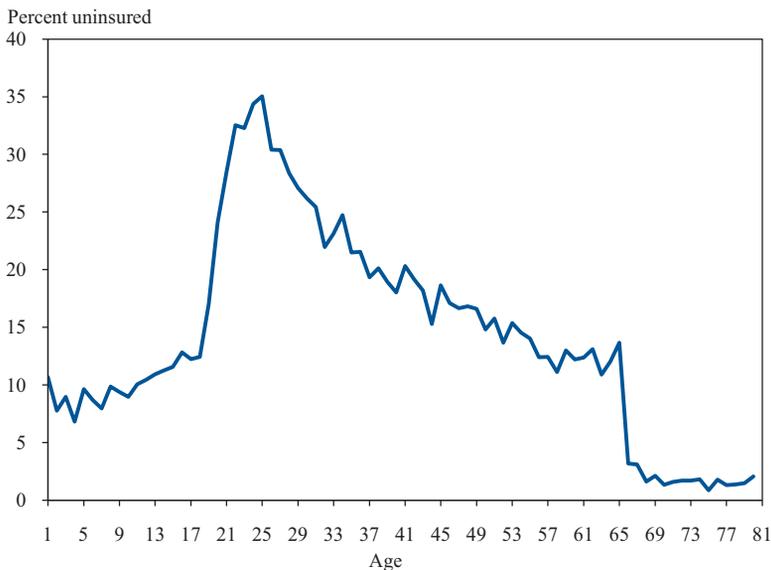
Although roughly half of the 2000–2008 decline in private coverage displayed in Figure 7-4 has been offset by an increase in public health insurance, the share of non-elderly adults without health insurance nevertheless rose from 17.2 to 20.3 percent. In other words, approximately 5.9 million more adults were uninsured in 2008 than would have been had the fraction uninsured remained constant since 2000. The decline in private health insurance coverage was similarly large among children, although it was more than offset by increases in public health insurance (most notably Medicaid and CHIP), so that less than 10 percent of children were uninsured by 2008 (DeNavas-Walt, Proctor, and Smith 2009).

The generosity of private health insurance coverage has also been declining in recent years. For example, from 2006 to 2009, the fraction of covered workers enrolled in an employer-sponsored plan with a deductible of \$1,000 or greater for single coverage more than doubled, from 10 to 22 percent. The increase in deductibles was also striking among covered workers with family coverage. For example, during this same three-year period, the fraction of enrollees in preferred provider organizations with a deductible of \$2,000 or more increased from 8 to 17 percent. Similar increases in cost-sharing were apparent for visits with primary care physicians. The fraction of covered workers with a copayment of \$25 or more for an office visit with a primary care physician increased from 12 to 31 percent from 2004 to 2009. These rising costs in the private market

fall disproportionately on the near-elderly, who have higher medical costs but are not eligible for Medicare. A recent study found that the average family premium in the individual market in 2009 for those aged 60–64 was 93 percent higher than the average family premium for individuals aged 35–39 (America’s Health Insurance Plans 2009).

**Low Insurance Coverage among Young Adults and Low-Income Individuals.** Figure 7-5 shows the relationship between age and the fraction of people without health insurance in 2008. One striking pattern is the sharp and substantial rise in this fraction as individuals enter adulthood. For example, the share of 20-year-olds without health insurance is more than twice that of 17-year-olds (28 percent compared with 12 percent).

Figure 7-5  
Percent of Americans Uninsured by Age



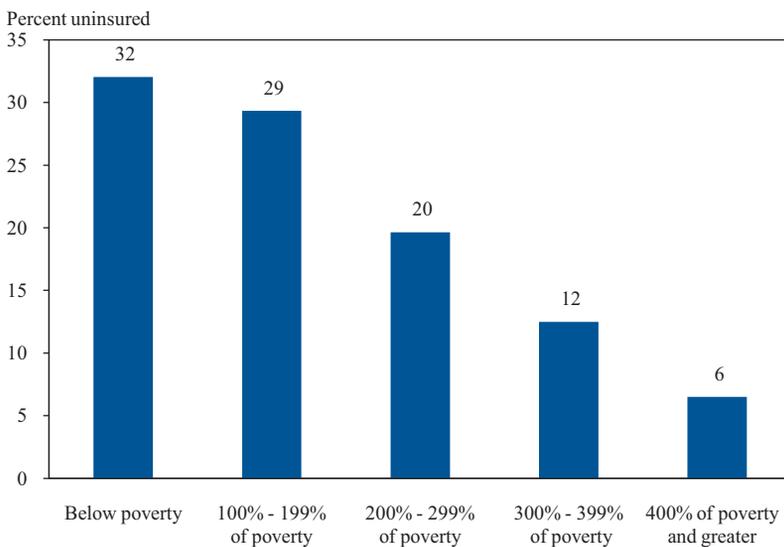
Source: Department of Commerce (Census Bureau), Current Population Survey, Annual Social and Economic Supplement.

Adverse selection is clearly a key source of this change. Many teenagers obtain insurance through their parents’ employer-provided family policies, and so are in large pools. Many young adults, in contrast, do not have this coverage and are either jobless or work at jobs that do not offer health insurance; thus, they must either buy insurance on the individual market or go uninsured. As described above, health insurance coverage in the individual market can be very expensive because of adverse selection. Many young adults also have very low incomes, making the cost of coverage

prohibitively high for them. Furthermore, because they are, on average, in very good health, young adults may be more tolerant than other groups of the risks associated with being uninsured.

The burden of rising costs also falls differentially on low-income individuals, who find it more difficult each year to afford coverage through employer plans or the individual market. Indeed, as shown in Figure 7-6, low-income individuals are substantially more likely to be uninsured than their higher-income counterparts. As the figure shows, non-elderly individuals below the Federal poverty line (\$10,830 a year in income for an individual and \$22,050 for a family of four in 2009) were five times as likely to be uninsured as their counterparts above 400 percent of the poverty line in 2008. These low rates of insurance coverage increase insurance premiums for other Americans because of the “hidden tax” that arises from the financing of uncompensated care.

Figure 7-6  
Share of Non-Elderly Individuals Uninsured by Poverty Status

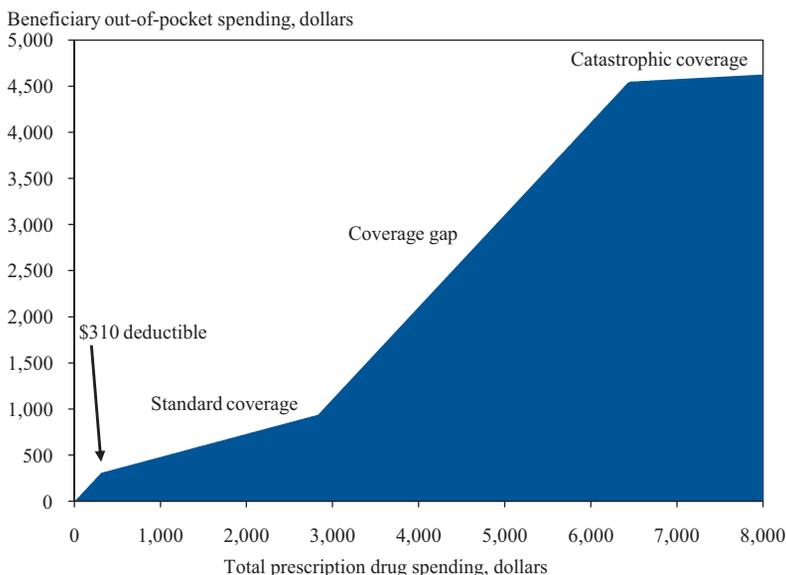


Source: Department of Commerce (Census Bureau), Current Population Survey, Annual Social and Economic Supplement.

**The Elderly.** Even those over the age of 65 are not protected from high costs, despite almost universal coverage through Medicare. Consider prescription drug expenses, for which the majority of Medicare recipients have coverage through Medicare Part D. As shown in Figure 7-7, after the initial deductible of \$310, a standard Part D plan in 2010 covers 75 percent

of the cost of drugs only up to \$2,830 in annual prescription drug spending. After that, enrollees are responsible for all expenditures on prescriptions up to \$6,440 in total drug spending (where out-of-pocket costs would be \$4,550), at which point they qualify for catastrophic coverage with a modest copayment. Millions of beneficiaries fall into this coverage gap—termed the “donut hole”—every year, and as a result many may not be able to afford to fill needed prescriptions.

Figure 7-7  
Medicare Part D Out-of-Pocket Costs by Total Prescription Drug Spending



Note: Calculations based on a standard 2010 benefit design.  
Source: Medicare Payment Advisory Commission, Part D Payment System, October 2009.

In 2007, one-quarter of Part D enrollees who filled one or more prescriptions but did not receive low-income subsidies had prescription drug expenses that were high enough to reach the coverage gap. For that reason, 3.8 million Medicare recipients reached the initial coverage limit and were required to pay the full cost of additional pharmaceutical treatments received while in the coverage gap, despite having insurance for prescription drug costs. One study found that in 2007, 15 percent of Part D enrollees in the coverage gap using pharmaceuticals in one or more of eight major drug classes stopped taking their medication (Hoadley et al. 2008).

**Small Businesses.** As described earlier, adverse selection is a serious problem for small businesses, which do not have large numbers of workers to pool risks. This problem manifests itself in two forms. The first is high costs. Because of high broker fees and administrative costs as well as adverse selection, small firms pay up to 18 percent more per worker for the same policy than do large firms (Gabel et al. 2006). The second is low coverage. Employees at small businesses are almost three times as likely as their counterparts at large firms to be uninsured (29 percent versus 11 percent, according to the March 2009 Current Population Survey). And among small businesses that do offer insurance, only 22 percent of covered workers are offered a choice of more than one type of plan (Kaiser Family Foundation and Health Research and Educational Trust 2009).

In recent years, small businesses and their employees have had an especially difficult time managing the rapidly rising cost of health care. Consistent with this, the share of firms with three to nine employees offering health insurance to their workers fell from 57 to 46 percent between 2000 and 2009.

As discussed in a Council of Economic Advisers report issued in July 2009, high insurance costs in the small-group market discourage entrepreneurs from launching their own companies, and the low availability of insurance discourages many people from working at small firms (Council of Economic Advisers 2009c). As a result, the current system discourages entrepreneurship and hurts the competitiveness of existing small businesses. Given the key role of small businesses in job creation and growth, this harms the entire economy.

Taken together, the trends summarized in this section demonstrate that in recent years the rapid rise in health insurance premiums has reduced the take-home pay of American workers and eaten into increases in Medicare recipients' Social Security benefits. Fewer firms are electing to offer health insurance to their workers, and those that do are reducing the generosity of that coverage through increased cost-sharing. Fewer individuals each year can afford to purchase health insurance coverage. The current system places small businesses at a competitive disadvantage. And finally, the steady increases in health care spending strain the budgets of families, businesses, and governments at every level, and demonstrate the need for health insurance reform that slows the growth rate of costs.

## HEALTH POLICIES ENACTED IN 2009

Since taking office, the President has signed into law a series of provisions aimed at expanding health insurance coverage, improving the quality of care, and reducing the growth rate of health care spending. The

American Recovery and Reinvestment Act of 2009 provided vital support to those hit hardest by the economic downturn while helping to ensure access to doctors, nurses, and hospitals for Americans who lost jobs and income. At the same time, legislation extended health insurance coverage to millions of children, and improvements in health system quality and efficiency benefited the entire health care system. These necessary first steps have set the stage for a more fundamental reform of the U.S. health care system, one that will ensure access to affordable, high-quality coverage and that genuinely slows the growth rate of health care spending.

### ***Expansion of the CHIP Program***

Just two weeks after taking office, the President signed into law the Children's Health Insurance Program Reauthorization Act, which provides funding that expands access to nearly 4 million additional children by 2013. This guarantee of coverage also kept millions of children from losing insurance in the midst of the recession, when many workers lost employer-sponsored coverage for themselves and their dependents. An examination of data from recent surveys by the Centers for Disease Control and Prevention found that private coverage among children fell by 2.5 percentage points from the first six months of 2008 to the first six months of 2009. Despite the fall in private coverage, however, fewer children were uninsured during that six-month period in 2009, in large part because public coverage increased by 3 percentage points (Martinez and Cohen 2008, 2009).

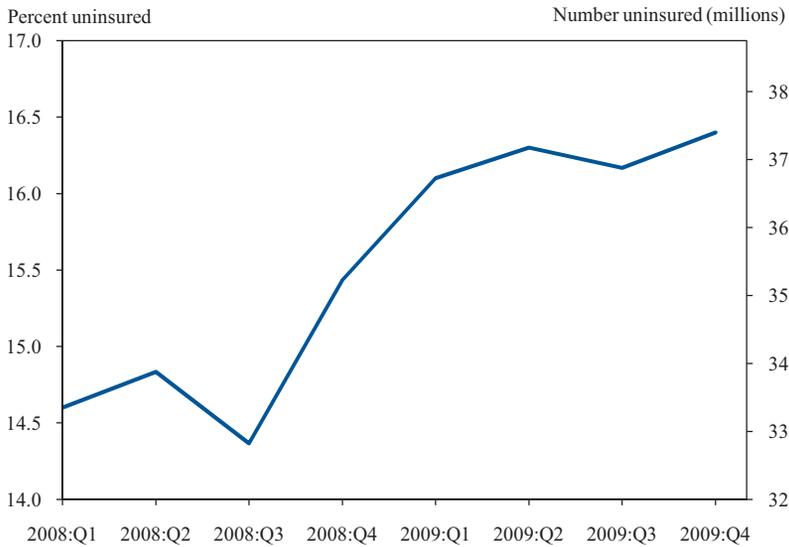
Approximately 7 million children (1 in every 10) were uninsured in 2008 (DeNavas-Walt, Proctor, and Smith 2009). Once fully phased in, the CHIP reauthorization legislation signed by the President will lower that number by as much as half from the 2008 baseline. In the future, this new legislation will enhance the quality of medical care for children and improve their health. Research has convincingly shown that expanding health insurance to children is very cost-effective, because it not only increases access to care but also substantially lowers mortality (Currie and Gruber 1996a, 1996b).

### ***Subsidized COBRA Coverage***

In part because of the difficulty of purchasing health insurance on the individual market (owing to adverse selection), most Americans get health insurance through their own or a family member's job. And what is true for dependent children is true for their parents: when economic conditions deteriorate, the number of people with employer-sponsored health insurance tends to fall. However, unlike the case with children, during the current recession public coverage has only offset part of the reduction

in private health insurance coverage among adults. Thus, the fraction of adults without health insurance has increased. Figure 7-8 uses survey data from Gallup to show that from the third quarter of 2008 to the first quarter of 2009, the share of U.S. adults without health insurance rose by 1.7 percentage points, from 14.4 to 16.1 percent, representing an estimated increase of 4.0 million uninsured individuals.

Figure 7-8  
Share Uninsured among Adults Aged 18 and Over



Source: Gallup-Healthways Well-Being Index, January 2010.

When workers at large firms lose their jobs, COBRA provisions give them the right to continue existing coverage for themselves and their families. However, they are often required to pay the full premium cost with no assistance from former employers and without favorable tax treatment of their insurance benefits. Thus, although a large fraction of workers who lose their jobs can still purchase health insurance through COBRA at group rates, many elect not to do so, likely because the coverage is not affordable to a family with a newly laid-off wage earner.

One provision of the American Recovery and Reinvestment Act addressed the recession-induced drop in employer-sponsored health insurance by subsidizing COBRA coverage so that individuals pay only 35 percent of their premium, with the Federal Government covering the remaining 65 percent. This large subsidy may partially explain why the growth in the share of American adults without health insurance slowed dramatically from

the first to the fourth quarter of 2009, even while the unemployment rate continued to rise. While the average rate of uninsurance in 2009 was still 1.4 percentage points higher than the average in 2008, the rate was fairly constant throughout 2009. Thus, while the CHIP expansion was providing stable coverage to millions of children who would otherwise have lost it, the COBRA subsidy was further reinforcing access to coverage for working parents and families who faced unemployment.

### ***Temporary Federal Medical Assistance Percentage (FMAP) Increase***

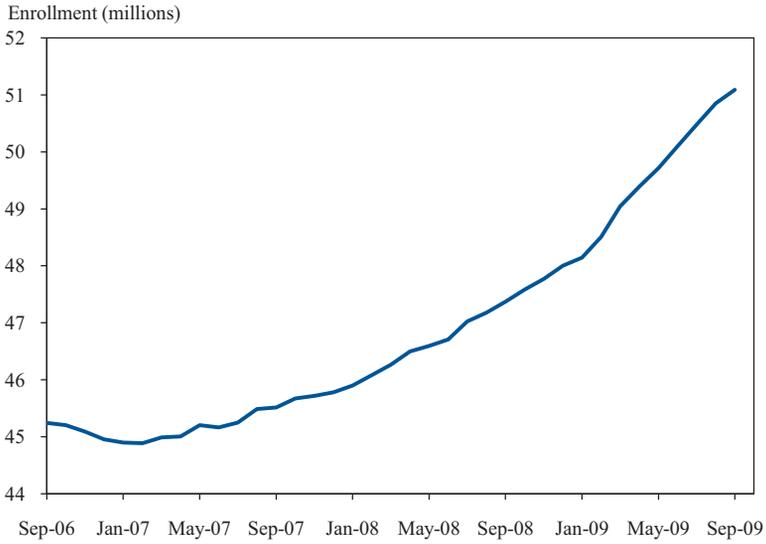
Historically, declines in employer-sponsored health insurance have led to increases in the number of people who qualify for public health insurance through programs such as Medicaid, which insured 45.8 million U.S. residents in December 2007. Because almost half of all Medicaid spending is typically financed by state governments, state Medicaid spending tends to rise substantially when economic conditions deteriorate. Coupled with the recession-induced drop in state tax revenues, these increases in Medicaid enrollment place a considerable strain on state budgets. And because virtually every state is required to balance its budget each year, increases in Medicaid enrollment often leave states with little choice but to raise taxes, lay off employees, reduce spending on public safety, education, and other important priorities, or reduce Medicaid benefits, provider payments, or eligibility. These policies are especially problematic when the economy is in severe recession, because they can stifle economic recovery.

Figure 7-9 uses administrative data from all 50 states and the District of Columbia to contrast the growth in Medicaid enrollment in the months leading up to the start of the recession in December 2007 with the corresponding growth during the recession.<sup>2</sup> An examination of the data displayed in the figure reveals that, after growing from 45.2 million in September 2006 to 45.8 million in December 2007, the number of Medicaid recipients increased much more rapidly in the subsequent 21 months, and stood at 51.1 million in September 2009. This represents an increase of 253,000 Medicaid recipients per month during the recession, versus an average increase of just 36,000 per month in the preceding 15 months.

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<sup>2</sup> Data on state Medicaid enrollment were derived from direct communication between the Council of Economic Advisers and state health departments in 50 states and the District of Columbia. Monthly enrollment from September 2006 through September 2009 was reported by all states with the exception of Vermont in the first 10 months considered. For each month from September 2006 through June 2007 in Vermont, the state's July 2007 Medicaid enrollment was used.

Figure 7-9  
Monthly Medicaid Enrollment Across the States



Source: Information from individual state health departments, compiled by CEA.

To help states pay for an expanding Medicaid program without raising taxes or cutting key services, one important component of the Recovery Act was a temporary increase in each state’s Federal Medical Assistance Percentage (FMAP), the share of Medicaid spending paid by the Federal Government. This fiscal relief allowed states to avoid cutbacks to their Medicaid programs or other adjustments that would have exacerbated the effects of the recession. The increased FMAPs were larger for states where unemployment increased the most, because their financial strains were greatest. To qualify for the increased FMAPs, states were required to maintain Medicaid eligibility at pre-recession levels.

A recent report by the Kaiser Family Foundation confirms that support from the Recovery Act—as well as the expansion of coverage for children enacted several weeks earlier in February 2009—was essential to preserving the ability of states to offer health insurance coverage to those most in need. In fact, more than half the states expanded access to health insurance coverage for low-income children, parents, and pregnant women in Medicaid and CHIP in 2009 (Ross and Jarlenski 2009).

## *Recovery Act Measures to Improve the Quality and Efficiency of Health Care*

Beyond supporting jobless workers and their families in the midst of the recession, the Recovery Act addressed structural weaknesses in the health care system by investing in its infrastructure and its workforce. These investments will help to build a health care system with lower costs and better health outcomes for the long term.

For example, the Recovery Act invested \$2 billion in health centers for new construction, renovation of existing facilities, and expansion of coverage. An additional \$500 million was allocated to bolster the primary care workforce to improve access to primary care in underserved areas. The Act provided a further \$1 billion in funding for public health activities to improve prevention and to incentivize wellness initiatives for those with chronic illness; both measures are aimed at improving the quality of care and ultimately bringing down costs. The Act also increased spending on comparative effectiveness research by \$1.1 billion, to give doctors and patients access to the most credible and up-to-date information about which treatments are likely to work best.

One final component of the Recovery Act was the Health Information Technology for Economic and Clinical Health Act, which expanded the adoption and use of health information technology through infrastructure formation, information security improvements, and incentives for adoption and meaningful use of certified health information technology. This investment in developing computerized medical records will reduce health care spending and improve quality while securing patients' confidential information.

These investments build a foundation for comprehensive health insurance reform by adding to the ranks of doctors, nurses, and other health care providers, especially in critical fields like primary care, and in areas of the country with the greatest need for a more robust medical workforce. Moreover, the investments in comparative effectiveness research and health information technology will make it much easier for information and quality improvements to spread rapidly between doctors, medical practices, and hospitals across the public and private sectors. When combined with the wide range of delivery system changes included in health insurance reform legislation, these investments are expected to contain costs and improve quality over the long run.

In summary, legislation passed in 2009 helped extend or continue health insurance coverage for the workers, families, and children affected by the current recession. Rather than focusing solely on today's crisis, the

legislation lays the groundwork for a reformed health care system that addresses the weaknesses, flaws, and inefficiencies of the status quo.

## 2009 HEALTH REFORM LEGISLATION

As this *Report* goes to press, Congress has come closer to passing comprehensive health insurance reform than ever before, with major bills having passed both the House and the Senate. As of this writing, whether those bills will lead to enactment of final legislation in the near future is uncertain. Nonetheless, the bills contain important features that would expand coverage, slow the growth rate of costs while improving the quality of care, and benefit individuals, businesses, and governments at every level. This section discusses the major features of the two bills—the House’s Affordable Health Care for America Act and the Senate’s Patient Protection and Affordable Care Act.

### *Insurance Market Reforms: Strengthening and Securing Coverage*

Both the House and the Senate bills contain important features that would immediately expand coverage and increase access to preventive care. The legislation would also strengthen regulation of the health insurance market, improve consumer protections, and secure coverage for more than 30 million Americans. These regulations would correct insurance market failures by preventing health insurers from responding to adverse selection by raising rates and denying coverage, thus stabilizing risk pools to secure access to affordable coverage.

Both versions of the legislation provide immediate Federal support for a new program to provide coverage to uninsured Americans with preexisting conditions. Combined with strong new consumer protections, these measures would ensure that millions of Americans can immediately purchase coverage at more affordable prices despite their personal medical history or health risks. Health insurance reform also makes immediate investments in community health centers, which would improve access to coverage among the most vulnerable populations. Both the House and Senate versions of reform immediately create reinsurance programs for employer health plans, providing coverage for early retirees to prevent them from becoming uninsured before they are covered by Medicare. Additionally, reform legislation would immediately begin to reform delivery systems for health care and improve transparency and choice for consumers. For example, the Senate proposal would create a website that would help

consumers compare coverage options by summarizing important aspects of each insurance contract in a consistent and easy-to-understand format.

New laws would help cover millions of young adults as they transition into the workforce by requiring insurers to allow extended family coverage for dependents through their mid-20s. The CBO and the Joint Committee on Taxation estimate that this requirement would lower average premiums per person in the large-group market by increasing the number of relatively healthy low-cost people in large-group pools (Congressional Budget Office 2009a).

In the years following reform, legislation would put into place strong new consumer protections to prevent denials of coverage or excessive costs for the less healthy. Insurers would be required to renew any policy for which the premium has been paid in full. Insurers could not refuse to renew because someone became sick, nor could they drop or water down insurance coverage for those who are or become ill. To prevent insurers from charging excessively high rates to the less healthy, reform legislation would also enact adjusted community rating rules for premiums.

Banning such treatment of individuals with preexisting conditions would not only allow insurance markets to better help individuals hedge against the risk of health care costs, but may also make the U.S. labor market more efficient. Without such protections, adults with preexisting conditions may be reluctant to change insurance providers and expose themselves to increased premiums. Workers who receive health insurance through their employers may therefore be less willing to change jobs, creating “job lock” that discourages desirable adjustments in the labor market.

In both versions of reform legislation, these provisions are linked with incentives for individuals to obtain coverage and for firms to insure their workers. While preventing insurance companies from discriminating based on preexisting conditions will help some of the neediest members of our society, in isolation these reforms could increase costs for individuals without preexisting conditions, potentially aggravating adverse selection. Without a responsibility to maintain health insurance coverage, individuals could forgo purchasing coverage until they fell ill, and thus not contribute to a shared insurance risk pool until their expected costs rose sharply. However, with restrictions on exclusions for preexisting conditions in place, high-cost individuals who sign up after falling ill could obtain coverage at low premiums. Thus, individuals who had contributed toward coverage would be faced with higher costs, potentially driving even more individuals out of coverage. To prevent a spiral of increasing costs and decreasing insurance rates resulting from adverse selection, both the House and the Senate bills establish a principle of joint individual and employer responsibility to

obtain and provide insurance, and would provide subsidies and tax credits that would assist in this process.

The bills would address other features of many health plans that limit their ability to help individuals insure against financial risk. Currently, insurers can put yearly and lifetime limits on coverage. For people with diseases such as cancer, life-saving treatment is often very costly, and exceeding annual and lifetime benefit limits can lead to bankruptcy. This problem is especially severe in the individual and small-group markets, where insurers have more discretion in designing policies. Insurance plans that allow individuals to bankrupt themselves may be socially inefficient because of the Samaritan's dilemma: medical bills that are unpaid when a patient becomes bankrupt impose a hidden tax on other participants in the health care market.

In addition to these insurance market reforms, legislation passed by Congress would require coverage of preventive care and exempt preventive care benefits from deductibles and other cost-sharing requirements in Medicare and private insurance. Evidence suggests that not only are certain preventive care measures cost-effective, but they can also help to prevent diseases that are responsible for roughly half of yearly mortality in the United States (Mokdad et al. 2004). Some measures, such as smoking cessation programs, discussing aspirin use with high-risk adults, and childhood immunizations, may even lower total health care spending (Maciosek et al. 2006). Because many people change insurance companies several times over the course of their lives, insurance companies may underinvest in preventive care that is cost-effective but does not reduce medical costs until far in the future. By encouraging all insurance companies to invest in preventive care, health insurance reform would increase the efficiency of the health care sector.

Finally, reform legislation takes steps to make prescription drug coverage more affordable and secure for senior citizens. The legislation would increase the initial coverage limit under Medicare Part D by \$500 in 2010 and also provide 50 percent price discounts for brand-name drugs in the "donut hole" discussed earlier. This discount would allow many Medicare Part D recipients to reduce their out-of-pocket spending on prescription drugs. Not only would fewer beneficiaries have to pay the full cost of their prescription drugs while in the donut hole, but those who do reach this coverage gap would also benefit from increased coverage before reaching that point.

In summary, within the first few years after passage, reform legislation in Congress would guarantee coverage for those with preexisting conditions, reform private insurance markets with strong consumer protections that

would stabilize risk pools and mitigate adverse selection, and strengthen public coverage under Medicare.

### *Expansions in Health Insurance Coverage Through the Exchange*

Central to both the House and the Senate bills is the health insurance exchange, which would allow individuals and employees of small businesses to choose among many different insurance plans. The exchange would provide a centralized marketplace to allow individuals, families, and small firms to pool together and purchase coverage much like larger firms do today, improving consumer choice and increasing pressure on insurers to offer lower prices and more generous benefits to attract customers. In its first year of operation, the exchange would be open to qualified individuals and small businesses.

Individuals and small businesses, which might otherwise purchase health insurance in the individual or small-group markets, would benefit from the economies of scale and greater buying leverage in the exchange, which could result in much lower premiums. The exchange would also provide transparent information on plan quality, out-of-pocket costs, covered benefits, and premiums for each offered plan, enabling individuals to select the plan that best fits their and their family's needs. The availability of easy-to-compare premium information would provide a powerful incentive for health insurers to price competitively, thus making coverage more affordable for participants in the exchange.

The new exchange would be especially beneficial for small business employees, who, as described earlier, face particularly severe challenges in the health insurance market. The bills would enable small businesses that meet certain criteria to purchase insurance through the exchange, allowing them and their workers to buy better coverage at lower costs. Moreover, many small businesses that provide health insurance for their employees would receive a tax credit to alleviate their disproportionately higher costs and to encourage coverage. The tax credit would lower the cost of coverage by as much as 50 percent. Reform would make it easier for small businesses to recruit talented workers and would also increase workers' incentives to start their own small businesses. A recent analysis of the Senate bill by the CBO found that premiums for a given amount of coverage for the same set of people or small businesses would fall in the individual and small-group markets as a result of reductions in administrative costs and increased competition in a centralized marketplace (Congressional Budget Office 2009a).

Most individuals who select a plan in the exchange would be eligible for subsidies that reduce the cost of their coverage. In both the House and

Senate bills, subsidies would be available to certain individuals and families with incomes below 400 percent of the Federal poverty line. The premium and out-of-pocket spending subsidies for plans purchased in the exchange would be larger for lower-income families, many of whom cannot afford the cost of a private plan. In addition, individuals with incomes below about 133 to 150 percent of the poverty line would be eligible for health insurance through the Medicaid program.

In the exchange, Federal subsidies would be tied to premiums for relatively lower-cost “reference” plans. Beneficiaries would, however, be able to buy more extensive coverage at an additional, unsubsidized cost.

### ***Economic and Health Benefits of Expanding Health Insurance Coverage***

CBO analyses of both the House and Senate bills indicate that, in part because of the creation of the exchanges and the expansion in Medicaid, more than 30 million Americans who would otherwise be uninsured would obtain coverage as a result of reform. These coverage expansions would improve not only the health and the economic well-being of affected individuals and families, but also the broader economy.

A comprehensive body of literature demonstrates that being uninsured leads to poorer medical treatment, worse health status, and higher mortality rates. Across a range of acute conditions and chronic diseases, uninsured Americans have worse outcomes, higher rates of preventable death, and lower-quality care. Additionally, being uninsured imposes on families a significant financial risk of bankruptcy caused by medical expenses.

Evidence from the state of Massachusetts—which expanded health insurance to all but 2.6 percent of its population in a 2006 reform effort—finds that expanding coverage increased regular medical care and lowered financial burdens for residents who gained coverage. Only 17.4 percent of adults with family incomes of less than 300 percent of the Federal poverty line reported forgoing care because of costs in 2008, compared with 27.3 percent in the pre-reform baseline in 2006 (Long and Masi 2009).

Taken together, this evidence strongly suggests that expanding coverage for Americans through health insurance reform would directly benefit millions of families by giving them access to the care they need to maintain their health without substantial financial burdens and risks. Moreover, because of the fixed costs of developing health care infrastructure such as trauma centers, increasing the share of people with health insurance can improve health outcomes for people with insurance as well.

Beyond the improvements for individuals and families, coverage expansions would produce benefits that extend throughout the entire economy. A CEA report in June 2009 estimated that economic gains from reduced financial risk for the uninsured totaled \$40 billion per year (Council of Economic Advisers 2009a). Moreover, the CEA report found an economic value of more than \$180 billion per year from averting preventable deaths caused by a lack of insurance. Taken together, these gains would far exceed the cost of extending coverage to the currently uninsured population.

The economic benefits of expanding coverage would extend to labor markets in the form of reduced absenteeism and greater productivity. According to the 2009 March Current Population Survey, 18.7 million non-elderly adults report having one or more disabilities that prevent or limit the work they can perform; of that total, 3.1 million lack health insurance. Approximately 50 percent of non-elderly adults who work report having at least one serious medical condition. Previous research has documented the indirect costs to employers of health-related productivity losses. Some of the costliest conditions—depression, migraines, and asthma—can often be effectively managed with prescription medications made more affordable by health insurance. This suggests that expanding access to coverage would improve productivity and labor supply by creating a healthier workforce that would lose fewer hours to preventable illnesses or disabilities.

### ***Reducing the Growth Rate of Health Care Costs in the Public and Private Sectors***

The House and Senate bills contain a number of provisions that would reduce the growth rate of health care spending in both the public and private sectors. Both bills create pilot programs in Medicare to bundle provider payments for an episode of care rather than for individual procedures. Under bundled payments, Medicare would provide a single reimbursement for an entire episode of care rather than multiple reimbursements for individual treatments. This payment strategy would give providers, organized around a hospital or group of physicians, a stronger incentive to coordinate and provide quality care efficiently rather than carry out low-value or unnecessary treatments and procedures. Recent research in the *New England Journal of Medicine* suggests that bundled payments could improve quality and substantially reduce health care spending (Hussey et al. 2009). The Department of Health and Human Services would be given authority to expand or extend successful pilot programs without additional legislative action.

Both bills also include measures that directly reduce waste in the current health care system. One example of such waste is the substantial overpayment to Medicare Advantage plans, which are currently paid an average of 14 percent more per recipient than traditional Medicare. The reform bills would reduce these overpayments, saving more than \$100 billion between 2010 and 2019 (Congressional Budget Office 2009b). Reducing the overpayments would also lower Medicare recipients' Part B premiums below what they otherwise would be and would extend the solvency of the Medicare Trust Fund.

Another component of the legislation that has the potential to slow the growth rate of health care spending is the Independent Payment Advisory Board included in the Senate bill. This board would have the authority to propose changes to the Medicare program both to improve the quality of care and to reduce the growth rate of program spending. Absent Congressional action, these recommendations would be automatically implemented.

Using the the CEA analysis of the House and Senate bills along with projections from CBO about the level of Federal spending on Medicare, Medicaid, and CHIP, it is possible to estimate the effect of reform on the growth rate of Federal health care spending. Recent CEA analyses of the House and Senate bills find that reform would lower total Federal spending on Medicare, Medicaid, and CHIP by 2019 below what it otherwise would have been (Council of Economic Advisers 2009b). Moreover, between 2016 and 2019, both bills would lower the annual growth rate of Federal spending on these programs by approximately 1.0 percentage point. State and local governments would also benefit financially from health insurance reform, as described in Box 7-1.

#### **Box 7-1: The Impact of Health Reform on State and Local Governments**

Although slowing the growth in health care costs will help the long-run fiscal situation of the Federal Government, some observers worry about how reform will affect state and local governments. To help ensure that virtually all Americans receive health insurance, both the Senate and the House bills call for expanding Medicaid eligibility. Because Medicaid is partly funded by states, some state officials fear that the state fiscal situation will deteriorate as a consequence of reform.

As documented by a CEA report published in September (Council of Economic Advisers 2009d), however, health insurance reform would

*Continued on next page*

*Box 7-1, continued*

improve the fiscal health of state and local governments in at least three important ways. First, state and local governments are already spending billions of dollars each year providing coverage to the uninsured; these costs would fall significantly as a consequence of health reform. Second, encouraging all individuals to become insured would reduce the hidden tax paid by providers of health insurance. Because state and local governments employ more than 19 million people, the total savings from removing the hidden tax is likely to be substantial. Third, an excise tax on high-cost plans would boost workers' wages by billions of dollars each year and thus increase state income tax revenues.

To understand the net consequences of reform for the fiscal health of state and local governments, the CEA studied the impact of reform for 16 states that are diverse along many important dimensions: geographic, economic, and demographic. For every state studied, health reform would result in substantial savings for state and local governments.

In addition to these public savings, the reform proposals would reduce the growth of health care costs in the private sector. One important mechanism through which reform could reduce these costs is the excise tax on high-cost insurance plans included in the Senate bill. Under current tax law, employer compensation in the form of wages is subject to the income tax, while compensation in the form of employer-provided health care benefits is not. Individuals may therefore have an incentive to obtain more generous health insurance than they would if wages and health insurance faced more equal tax treatment. Absent other incentives for individuals to obtain insurance, the preferential tax treatment of health insurance may be beneficial, because it encourages firms to provide health insurance to their workers and facilitates pooling. Nonetheless, placing no limit on this subsidy likely leads to health insurance that is more generous than would be efficient in some cases.

To help contain the growth in the cost of these plans without jeopardizing the risk-pooling benefits, the Senate bill would impose a tax on only the most expensive employer-sponsored plans. Although only a small share of plans would be affected, CEA estimates based on data from the CBO suggest that the excise tax on high-cost insurance plans would reduce the growth rate of annual health care costs in the private sector by 0.5 percentage point per year from 2012 to 2018. The excise tax would encourage workers and their firms' human resources departments to be more watchful consumers and would give insurers a powerful incentive to

price competitively. And to the extent that bundling, accountable care organizations, and other delivery system reforms in both the House and Senate bills would spill over to the private sector, it is likely that the rate of growth of health care spending in the private sector would fall by considerably more than 0.5 percentage point per year. Lower increases in private health insurance premiums would lead to substantially higher take-home earnings for workers.

Reform would also reduce private spending on health care in other important ways. As noted, encouraging all individuals to obtain health insurance would likely reduce average costs for people who are insured. Reducing the hidden tax on health insurance premiums imposed by uncompensated care for the uninsured, for example, would reduce the financial burden not only on state and local governments, but also on individuals. CBO estimates of the Senate legislation find that reform has the power to reduce small-group premiums by up to 2 percent and even large-group premiums by up to 3 percent. And according to research by the Business Roundtable, reforms similar to those included in both the House and Senate bills could reduce employer-sponsored health insurance costs for family coverage by as much as \$3,000 per worker by 2019 relative to what those costs otherwise would have been.

### ***The Economic Benefits of Slowing the Growth Rate of Health Care Costs***

Reform as envisioned in both the House and Senate bills passed in late 2009 would substantially lower the growth rate of health care spending. Of course, spending would increase in the very short run as coverage was extended to more than 30 million Americans who would otherwise be uninsured. But, according to the CBO, these temporary increases would soon be more than offset by the slowdown in the growth rate of spending, with the net savings increasing over time (Congressional Budget Office 2009b, 2009c).

A report released by the CEA in June 2009 demonstrated that slowing the growth rate of health care costs would raise U.S. standards of living by freeing up resources that could be used to produce other goods and services. An examination of the cost reduction measures contained in the Senate bill suggests that the typical family would see its income increase by thousands of dollars per year by 2030. Total GDP would be substantially higher as well, driven upward by both increased efficiency and increased national saving.

Slowing the growth rate of health care costs would also lower the Federal budget deficit. Projections by the CBO of both the House and the Senate legislation suggest that the bills would lower the deficit substantially

in the upcoming decade, and even more in the next decade. These savings would obviate large tax increases or cuts in other important priority areas. As discussed in Chapter 5, it would be the single most important step toward addressing the Nation's long-run fiscal challenges.

Finally, reform that genuinely slows the growth of health care costs could increase employment for a period of time by lowering the unemployment rate that is consistent with steady inflation. These effects could be important, with CEA estimates suggesting an increase of more than 300,000 jobs for a period of time if health care costs grew by 1 percentage point less each year.

## CONCLUSION

In recent years, health care costs in the Nation's private and public sectors have been rising at an unsustainable rate, and the fraction of Americans who are uninsured has steadily increased. These trends have imposed tremendous burdens on individuals, employers, and governments at every level, and the problems have grown yet more severe during the past two years with the onset of the worst recession since the Great Depression.

Last year, the President signed into law several policies that have cushioned the worst of the economic downturn, including an expansion in the Children's Health Insurance Program and an extension of COBRA coverage for displaced workers and their families. Other policies, such as increased funding for health information technology, will improve the long-run efficiency and quality of the health care sector.

Legislation passed by both the House and the Senate in late 2009 would expand health insurance coverage to tens of millions of Americans while slowing the growth rate of health care costs. These reforms would improve the health and the economic well-being of individuals and families, help small businesses, stimulate job creation, and ease strains on Federal, state, and local governments imposed by rapidly rising health care costs.



## C H A P T E R 8

# STRENGTHENING THE AMERICAN LABOR FORCE

The recession has been extremely difficult for American workers and families. One in ten workers is now unemployed, wages and hours worked have fallen, and many families are struggling to make ends meet. Making matters worse, the recession followed a sustained period of rising inequality and stagnation in the living standards of typical American workers. A central challenge in coming years will be to smooth the transition to a sustainable growth path with more widely shared prosperity.

As we begin to recover from the recession, we will see a new and much-changed labor market. Some industries that grew unsustainably large in recent years, such as construction and finance, will recover but will not immediately return to past employment levels. The same may be true for traditional manufacturing, which has been shrinking as a share of the economy for decades. The pace of employment decline will surely moderate after the recession, but many former workers in traditional manufacturing will need to transition into new, growing sectors.

In the place of the declining industries will come new opportunities for American workers. Health care will remain an important source of growth in the labor market, as will high-technology sectors including clean energy industries and advanced manufacturing. Well-trained and highly skilled workers will be best positioned to secure good jobs in these new and growing sectors. The best way to prepare our workforce for the challenges and opportunities that lie ahead is by strengthening our education system, creating a seamless, efficient path for every American from childhood to entry into the labor market as a skilled worker ready to meet the needs of the new labor market.

Both individuals and the economy as a whole benefit from increased educational attainment and improved school quality. A focus on access, equity, and quality for all American students, from early childhood through high school and into postsecondary education and training throughout

workers' careers, will help ensure that the benefits of economic growth are widely shared.

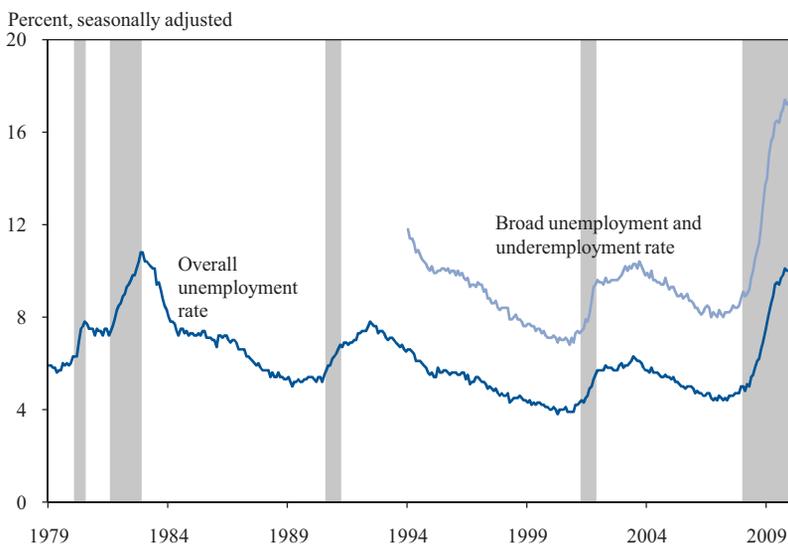
## CHALLENGES FACING AMERICAN WORKERS

The last few years have been a challenging time for American workers, with the high unemployment of the current recession compounding longer-run trends toward increased insecurity and inequality.

### *Unemployment*

As of December 2009, the unemployment rate was 10.0 percent, a rate that has been exceeded only once since the Great Depression. As high as it is, however, this rate understates just how weak the labor market is. Many Americans who would like to work have given up hope of finding a job and have dropped out of the labor force; others who would like full-time jobs have settled for part-time work. Figure 8-1 shows both the conventional unemployment rate and a broader measure of labor underutilization that includes not just unemployed workers but also those who would like jobs

Figure 8-1  
Unemployment and Underemployment Rates



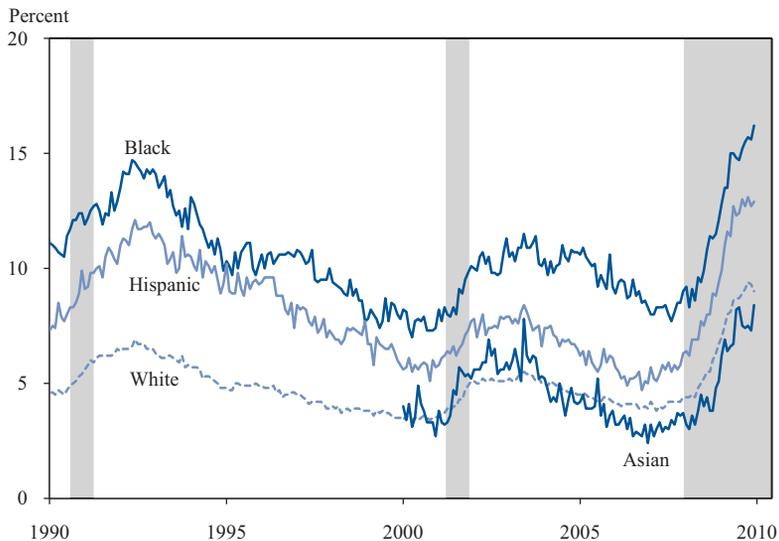
Notes: Grey shading indicates recessions. The overall unemployment rate represents the share of the labor force that is unemployed (those actively looking for work). The broad unemployment rate is a variant of the overall unemployment rate that adds marginally attached workers (those not actively looking for a job, but want one and have looked for one recently) as well as workers employed part-time for economic reasons to the numerator (the “unemployed”), and adds marginally attached workers to the denominator (the “labor force”).

Source: Department of Labor (Bureau of Labor Statistics), Employment Situation Table A-12, Series U-3 and U-6.

but have given up looking for work and those who are employed part-time for economic reasons. This measure indicates that more than one in six potential workers are unemployed or underemployed. Another measure of labor market conditions that accounts for those who have given up looking for work is the employment-to-population ratio. In December, fewer than six in ten adults were employed, the lowest ratio since 1983. A final useful labor market indicator is the number of long-term unemployed—those without jobs for 27 weeks or more. More than one-third of unemployed Americans have been seeking work for more than 26 weeks, the highest share since the series began in 1948.

The employment situation is even worse for members of racial and ethnic minorities. Figure 8-2 shows the unemployment rate for whites, blacks, Hispanics, and Asians. While the unemployment rate for whites topped out at 9.4 percent in October 2009 and has declined slightly since then, the rate for blacks exceeds 16 percent and has continued to rise, while that for Hispanics is nearly 13 percent. The disproportionate impact of the current recession on blacks and Hispanics mirrors that seen in past business cycles. It is critical that all Americans be able to participate fully and equally in our economic recovery.

Figure 8-2  
Unemployment Rates by Race



Notes: Grey shading indicates recessions. Hispanics may be of any race. Respondents with multiple races are excluded from the white, black, and Asian categories. Series for whites, blacks, and Hispanics are seasonally adjusted. Asian series is not seasonally adjusted and is not available before 2000.

Source: Department of Labor (Bureau of Labor Statistics), Employment Situation Table A-2.

Even a quick return to job growth will not immediately eliminate employment problems, as it will take time to create the millions of new jobs needed to return to normal employment levels. Many workers will have difficulty finding work for some time to come. Extended periods of high unemployment and low job creation rates mean that many displaced workers will exhaust their unemployment insurance benefits before jobs become available in large numbers. After months or even years of unemployment, most who exhaust their benefits will likely have used up whatever savings they had when they lost their jobs. Many will be forced to turn to public assistance—Temporary Assistance for Needy Families, Supplemental Nutritional Assistance (formerly known as food stamps), or other similar programs—to make ends meet.

Sustained periods of low labor demand also have negative repercussions for the long-run health of the economy. Mounting evidence indicates that displacement during bad economic times leads to long-run reductions in workers' productivity (Jacobson, LaLonde, and Sullivan 1993), likely because the displaced workers lose job skills, fall out of habits needed for successful employment, and have trouble convincing employers that they will be good employees. The resulting loss of "human capital" reduces workers' earning power, even after the economy recovers.

Deep downturns have particularly large effects on young Americans. The unemployment rate for teenagers in December was 27.1 percent. Research shows that teens who first enter the labor market during a recession can have trouble getting their feet onto the first rung of the career ladder, leaving them a step or more behind throughout their lives (Kahn forthcoming; Oreopoulos, von Wachter, and Heisz 2006; Oyer 2006). There is also evidence that when parents lose their jobs, their children's long-run economic opportunities suffer (Oreopoulos, Page, and Stevens 2008).

### *Sectoral Change*

The Great Recession has aggravated an already challenging trend: sectoral shifts that are changing the nature of work. While most American workers were once engaged in producing food and manufactured goods, often through physical labor that did not require a great deal of training, the United States is increasingly a knowledge-based society where workers produce services using analytical skills. The changing economy offers tremendous opportunities for American workers in high technology, in the new clean energy economy, in health care, and in other high-skill fields.

Accompanying these shifts in the composition of employment have been changes in the institutions that govern the labor market. The prototypical American career once involved working for a single employer for many

years, backed by a union that bargained for steady wage increases and for a pension that promised a stable, guaranteed income in retirement. The labor market has changed. Fewer than one in seven workers belongs to a union, and most people can count on changing employers several times over their careers. Moreover, the vast majority of retirement plans are now “defined contribution,” meaning that workers’ retirement incomes depend on the success of their individual investment decisions and on the performance of asset markets as a whole. This shift has meant added risk for workers, particularly those whose planned retirements coincide with downturns in asset prices.

### *Stagnating Incomes for Middle-Class Families*

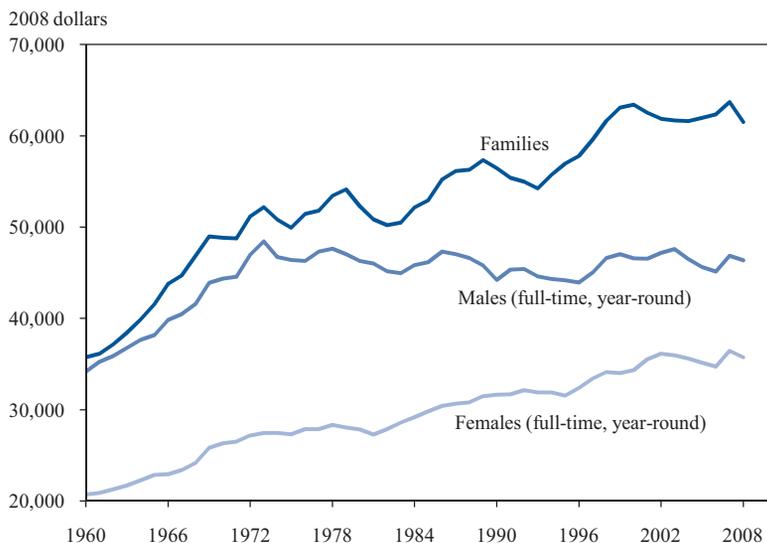
A final major challenge facing American workers is the decades-long stagnation in living standards for typical families and the related increase in inequality. Figure 8-3 offers two looks at income trends over the past half century. First, it shows real median family income—the level at which half of families have higher income and half have lower income—over time. The median rose steadily until 1970, but then the rate of growth slowed substantially, and since 2000, the median has actually fallen.

One determinant of family income is the number of individuals working outside of the home. Female labor force participation has risen dramatically: in 1960, just over 40 percent of adult women (aged 18–54) participated in the labor force; by 2000, approximately three-quarters did. This increase in female labor force participation contributed to the rise in family incomes. However, the female labor force participation rate has been roughly stable since 2000, and there are not likely to be future increases in participation as dramatic as those seen in the past. Further increases in family incomes will likely rely on growth in individual earnings.

The other two series in Figure 8-3 show the median earnings for men and women working full-time, year-round jobs. Real median female year-round earnings have grown steadily by about 1.1 percent per year on average since 1960, reflecting in part the gradual leveling of labor market barriers to women’s career advancement. But real male earnings have been essentially flat since the early 1970s. One source of the stagnation of median male earnings and the reduced growth rate of median female earnings is that productivity growth slowed between 1973 and 1995 (Chapter 10). But this is not a complete explanation. Even at a reduced growth rate, American workers’ productivity has more than doubled in the last 40 years.

A partial explanation for the divergence between productivity and earnings is the rapid rise in health care costs in recent years: an ever-greater share of the compensation paid by employers has gone toward health

Figure 8-3  
Real Median Family Income and Median Individual Earnings

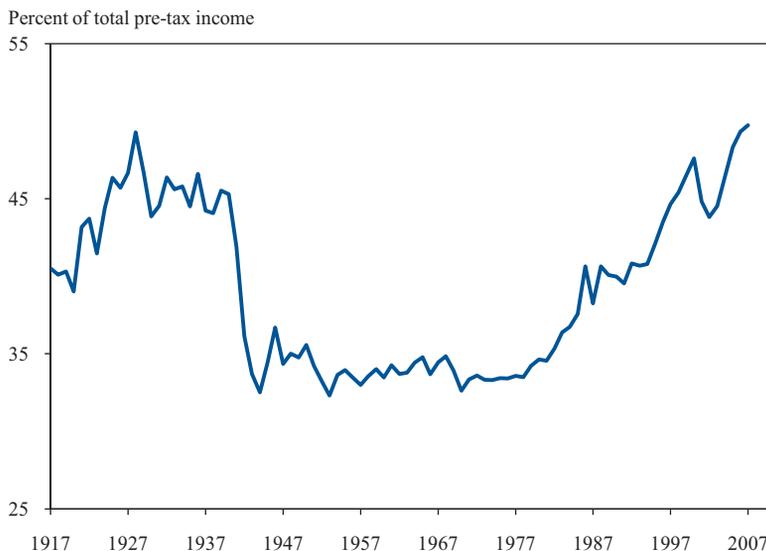


Notes: Family income measure is total money income excluding capital gains and before taxes. Median earnings series are for full-time, year-round workers; prior to 1989, only civilian workers are included. All series are deflated using CPI-U-RS.  
Sources: Department of Commerce (Census Bureau), Income, Poverty, and Health Insurance Coverage in the United States Table A-2; Current Population Survey, Annual Social and Economic Supplement, Historical Income Table F-12.

insurance premiums, which have risen much faster than inflation. This makes health reform an urgent priority. As discussed in Chapter 7, the proposals under consideration in Congress will slow the growth in health care costs, allowing American workers to realize more of the benefits of their hard work through increased take-home pay.

A second explanation is that per capita earnings are distributed in an increasingly unequal way, with ever-smaller shares going to workers in the middle and bottom of the distribution (Kopczuk, Saez, and Song forthcoming). Earnings inequality is compounded by inequality in nonlabor income, including dividends, interest, and capital gains. Figure 8-4 shows that in recent years nearly half of all income—including both wages and salaries and nonlabor income—has gone to 10 percent of families. The top 1 percent of families now receive nearly 25 percent of income, up from less than 10 percent in the 1970s (Piketty and Saez 2003). Today's income concentration is of a form not seen since the 1920s. Although there is nothing inherently wrong with high incomes at the top of the distribution, they are problematic if they come at the expense of the rest of workers. A major challenge for American public policy is to ensure that prosperity is again broadly shared.

Figure 8-4  
Share of Pre-Tax Income Going to the Top 10 Percent of Families



Note: Includes capital gains.

Sources: Piketty and Saez (2003); recent data from <http://elsa.berkeley.edu/~saez/TabFig2007.xls>.

## POLICIES TO SUPPORT WORKERS

The Administration's first priority upon taking office was to strengthen the economy and the labor market, helping to provide jobs for those who need them. According to Council of Economic Advisers estimates, the American Recovery and Reinvestment Act of 2009 had created or saved between 1.5 million and 2 million jobs as of the fourth quarter of 2009 (Council of Economic Advisers 2010).

At the same time, the Administration has worked to strengthen the safety net for those who remain unemployed. The Recovery Act provided unprecedented support for the jobless, with increased benefits for every unemployment insurance recipient, the longest extension of unemployment benefits in history, an expansion of the Supplemental Nutrition Assistance Program, and assistance with health insurance premiums for those who have lost their jobs. These provisions have directly helped millions of out-of-work Americans pay for housing, put food on the table, and maintain access to medical care. Moreover, because the unemployed are likely to spend any benefits they receive, these provisions have supported increased economic activity, strengthening the labor market and helping to create the job openings that will be needed to move people back into work. The safety net provisions in the Recovery Act are scheduled to expire at the end of

February 2010, but because of the ongoing weakness in the labor market, the Administration is working with Congress to extend them further.

The Recovery Act also included provisions to reform the unemployment insurance system, making it work more effectively in today's economy. These provisions extend unemployment insurance eligibility to many low-wage and part-time workers who were not previously eligible. These and other recent initiatives will also make it possible for many unemployed workers to draw out-of-work benefits while participating in training that prepares them to enter new fields.

Even after the labor market recovers, the dynamic American economy will continue to pose challenges—while also creating opportunities—for workers. Rapid technological change will cause shifts in the labor market, forcing some workers into unanticipated mid-life career changes. Policy can help to ease these transitions. Most important, it can ensure that workers who may switch careers several times during their lifetimes are able to maintain health insurance and to support themselves in retirement. As discussed in Chapter 7, comprehensive health care reform will eliminate preexisting conditions restrictions in health insurance and improve access to insurance in the individual market. These changes will make it much easier for people to maintain insurance when they change jobs or pursue entrepreneurial opportunities.

Declines in stock prices and home values have put serious pressure on many Americans' retirement plans and have highlighted the importance of improved retirement security. The Administration has proposed several measures to increase saving by low- and middle-income workers. Efforts include expanded access to retirement plans along with rule changes to streamline enrollment in 401(k) and IRA programs, facilitate simple saving strategies, and reorient program default options to emphasize saving. And, most important, the Administration is committed to protecting Social Security, thus ensuring that it can provide a reliable source of income for future retirees, as it has for their parents and grandparents.

Health and retirement security need to be accompanied by labor market institutions that support and protect workers. Labor unions have long been a force helping to raise standards of living for middle-class families. They remain important, and we need to reinforce the principle that workers who wish to join a union should have the right to do so.

Another set of institutions in need of attention is our immigration system. The current framework absorbs considerable resources but does not serve anyone—native workers, employers, taxpayers, or potential immigrants—well. Particular problems are posed by the presence of large numbers of unauthorized immigrants and the lengthy queues—some over 20 years—for legal residency.

Reform of the immigration system can strengthen our economy and labor market. Reform should provide a path for those who are currently here illegally to come out of the shadows. It should include strengthened border controls and better enforcement of laws against employing undocumented workers, along with programs to help immigrants and their children quickly integrate into their communities and American society. Future immigration policy should be more responsive to our economy's changing needs. Reform of the employment-based visa and permanent residency programs will also help reduce the incentives to immigrate illegally by giving potential immigrants a more viable legal path into the United States.

## **EDUCATION AND TRAINING: THE GROUNDWORK FOR LONG-TERM PROSPERITY**

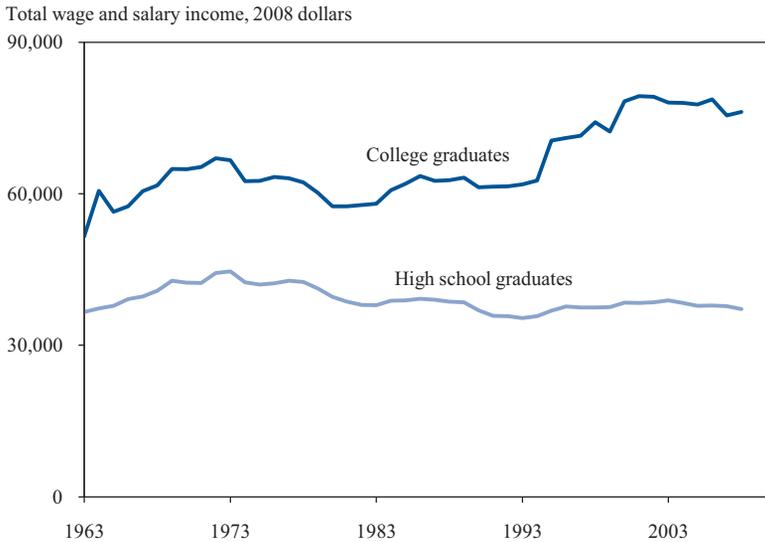
Rebuilding our economy on a more sustainable basis, investing in future productivity, fostering technological and other forms of innovation, and reforming our health care system to deliver better outcomes at lower costs are all crucial to long-run increases in living standards, and all are discussed elsewhere in this report. But one fundamental component of a strategy to ensure balanced, sustained, and widely shared growth is a robust system of education and training. The positive link between education and worker productivity—the cornerstone of economic prosperity—is well established. In fact, research has credited education with up to one-third of the productivity growth in the United States from the 1950s to the 1990s (Jones 2002).

### ***Benefits of Education***

At the individual level, there is a strong relationship between educational attainment and earnings (Card 1999). The earnings premium shows up at all levels of education. Those who complete one year of post-secondary education earn more than those who stop after high school, while those who complete two years or finish degrees earn more still. And job training for the unemployed has been shown by rigorous studies to raise participants' future earnings (Manpower Demonstration Research Corporation 1983; Jacobson, LaLonde, and Sullivan 2005).

The earnings premium associated with education is far larger than the cost—in tuition and forgone earnings—of remaining in school (Barrow and Rouse 2005), and it has grown in recent decades. Figure 8-5 shows the trends in the average annual earnings of individuals with high school diplomas but no college and of those with bachelor's degrees. In the mid-1960s, college graduates earned roughly 50 percent more than high school graduates, on average; by 2008, the premium had more than doubled.

Figure 8-5  
Total Wage and Salary Income by Educational Group



Notes: Figures for full-time workers aged 25-65 who worked 50-52 weeks in the calendar year. Before 1991, education groups are defined based on the highest grade of school or year of college completed. Beginning in 1991, groups are defined based on the highest degree or diploma earned. Incomes are deflated using the CPI-U.  
Source: Department of Labor (Bureau of Labor Statistics), March Current Population Survey, 1964-2009.

Education has other important benefits besides increased earnings. For example, recent studies have found that education improves people's health (Cutler and Lleras-Muney 2006; Grossman 2005). The explanation may be that better educated people make better health-related decisions, such as exercising or not smoking, or that education allows for easier navigation of a complex health care system. Education's benefits also extend beyond the individual. More educated people commit fewer crimes, vote more, and are more likely to support free speech (Dee 2004; Lochner and Moretti 2004). They also make their neighbors and coworkers more productive (Moretti 2004).

### ***Trends in U.S. Educational Attainment***

The United States has historically had the world's best education system. Although most European countries once limited advanced education to the economic elite, the United States has historically made it broadly available. U.S. secondary schools have been free and generally accessible since early in the 20th century. By the 1950s, nearly 80 percent of older teens (aged 15-19) in the United States were enrolled in secondary school, compared with fewer than 40 percent in Western Europe. The

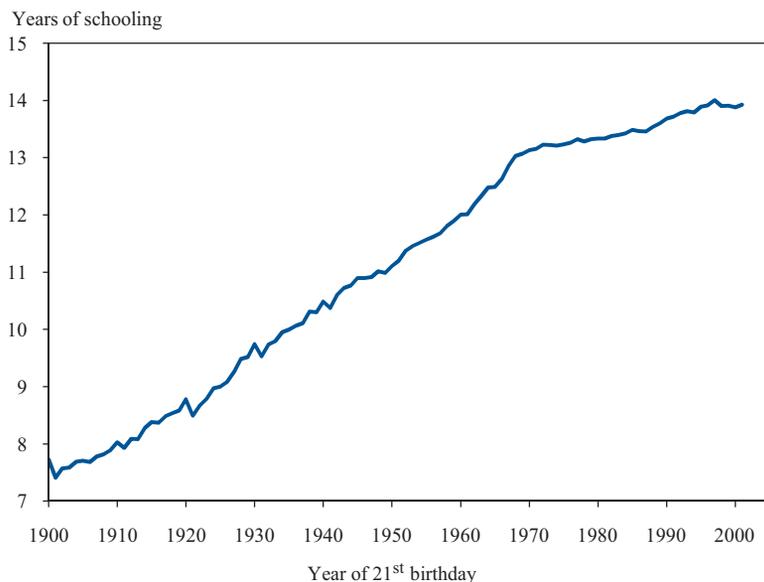
widespread expansion of state colleges and universities, begun under the Morrill Land Grant Act of 1862, led to even further advances in American education. Average educational attainment of people born in 1975 was over five years higher than that of those born in 1895. About 50 percent of the gain was attributable to increases in high school education, about 30 percent to increases in college and postcollege education, and the remainder to continued increases in elementary education (Goldin and Katz 2008). During the second half of the 20th century, as educational attainment rose worldwide, the United States became a clear leader in graduate education, attracting the brightest students from around the world. Some remained in the United States, adding importantly to the Nation's human capital stock and its diversity, while others returned to their home countries and used the education they got here to help increase prosperity there.

Harvard economists Claudia Goldin and Lawrence Katz contend that America's strong educational system helped make the United States the richest nation in the world (Goldin and Katz 2008). Over the past several decades, however, U.S. leadership in education has slipped. Although the Nation remains preeminent in postgraduate education, we can no longer claim to be home to the most educated people in the world.

For decades, the number of educated American workers grew faster than did the demand for them. But beginning with the cohort that completed its schooling in the early 1970s, the growth rate in the supply of educated Americans slowed significantly. This can be seen in Figure 8-6, which shows the mean years of schooling of Americans by year of birth. High school and college graduation rates, which grew steadily for many decades, began to stagnate, and younger generations no longer graduate at significantly higher rates than did previous generations. This slowdown in the growth of educational attainment has contributed to rising income inequality, as the shortage of college-educated workers has meant rising wages for high-skill work and falling wages for work requiring less education. The current recession may provide an opportunity to reverse this slowdown but only if our education system can keep up with increased demand (Box 8-1).

Meanwhile, other developed countries have continued to improve their educational outcomes, and the United States has slipped behind several other advanced countries at both the high school and postsecondary levels. Among the cohort born between 1943 and 1952—a group that largely completed its education by the late 1970s—the United States leads the world in the share with at least a bachelor's degree or the equivalent. In more recent cohorts, the percentage completing college has been roughly stable in the United States while increasing substantially in several peer countries. Figure 8-7 shows that only 40 percent of Americans born between 1973 and

Figure 8-6  
Mean Years of Schooling by Birth Cohort



Notes: Years of schooling at 30 years of age. Methodology described in Goldin and Katz (2007). Graph shows estimates of the average years of schooling at 30 years of age for each birth cohort, obtained from regressions of the log of mean years of schooling by birth cohort-year cell on a full set of birth cohort dummies and a quartic in age. Sample includes all native-born residents aged 25 to 64 in the 1940-2000 decennial census IPUMS samples and the 2005 CPS MORG. For further details on the method and data processing, see Goldin and Katz (2008, Figure 1.4) and DeLong, Goldin, and Katz (2003, Figure 2.1). Sources: Department of Commerce (Bureau of the Census), 1940-2000 Census IPUMS, 2005 CPS MORG; Goldin and Katz (2007).

### Box 8-1: The Recession's Impact on the Education System

Today's weak labor market is likely to lead to short- and medium-run increases in school enrollments, as high unemployment pushes many young people to increase their job skills through further education. Indeed, college enrollments rose substantially in 2008 relative to 2007, and preliminary reports suggest further increases in 2009. The resulting increase in educational attainment will offer long-run benefits for the economy, because today's students will be more productive workers when labor demand returns to full strength.

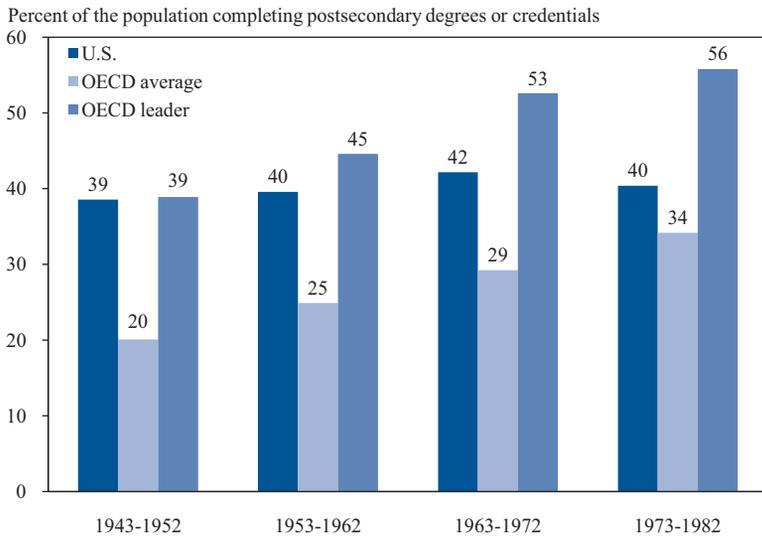
In the short run, however, elevated enrollments are placing strains on colleges, particularly the two-year colleges that are seeing most of the enrollment increase, as colleges' costs are rising at the same time state

*Continued on next page*

*Box 8-1, continued*

funding is being cut. Elementary and secondary schools are under similar strains. In part because of reduced state funding, schools employed roughly 70,000 fewer teachers and teachers' assistants in October 2009 than a year earlier, even though student enrollments were up. The reduction in per-pupil resources at both levels is an unfortunate budgetary response. At this time of high unemployment, it is desirable to encourage human capital formation, not make it more difficult. The State Fiscal Stabilization Fund, part of the Recovery Act, is helping in this regard, and recipients credit the Act with creating or saving at least 325,000 education jobs through the third quarter of 2009.

Figure 8-7  
Educational Attainment by Birth Cohort, 2007



Notes: Postsecondary degrees or credentials include only those of normal duration of two years or more and correspond to the Organisation for Economic Co-operation and Development (OECD) tertiary (types A and B) and advanced research qualifications. U.S. data reflect associate's, bachelor's, and more advanced degrees.

Sources: Organisation for Economic Co-operation and Development (2009); OECD Indicators Table A1.3a.

1982 have completed associate's degrees or better. Equivalent attainment rates are higher in nine other countries, led by Canada and Korea, where 56 percent completed some postsecondary degree or extended certificate program. High school graduation rates show a similar pattern, with the United States slipping from the top rank to the middle in recent decades.

## *U.S. Student Achievement*

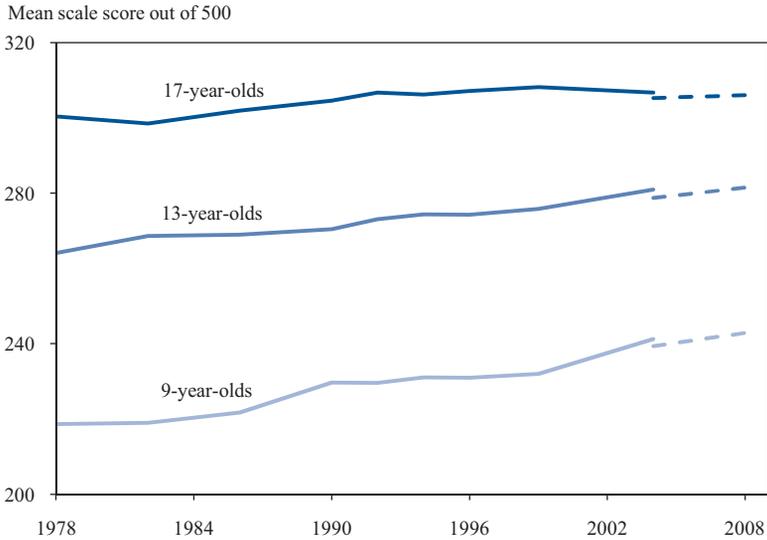
U.S. student achievement, as measured by assessments that capture how much students know at particular ages or grades, has improved notably in recent years, even as attainment has stagnated. The most reliable barometer is the National Assessment of Education Progress (NAEP), which has been administered consistently for more than three decades. Figure 8-8 shows average NAEP math scores for students at three different ages from 1978 through 2008. The performance of 9-year-olds (who are typically enrolled in 4th grade) and 13-year-olds (typically 8th grade) has improved over the past 35 years. The size of the achievement gains is impressive. Nearly three-quarters of 13-year-olds in 2008 scored above the 1978 median, with similar gains throughout the distribution. The performance of 17-year-olds (typically 12th graders) has also improved, although the gain was smaller.

Despite recent progress, American students are not doing as well as they should. In addition to average performance, the NAEP program measures the fraction of students who attain target achievement levels defined based on the skills that children at each age and grade should have mastered. A student is judged “proficient” if he or she demonstrates age- or grade-appropriate competency over challenging subject matter and shows an ability to apply knowledge to real-world situations. In the most recent tests, only 31 percent of 8th graders were proficient in reading and only 34 percent in math. Proficiency rates are similar in 4th grade.

For some subgroups, proficiency rates were much lower. Only 12 percent of black students and 17 percent of Hispanics were proficient in math in 8th grade. The low achievement in these subgroups is also reflected in low attainment. In 2000, only 81 percent of black young adults (aged 30–34) had graduated from high school, and only 15 percent had bachelor’s degrees. Although racial and ethnic gaps have narrowed importantly in recent decades—the black-white and Hispanic-white mathematics gaps at age 13 in the NAEP long-term trend data are each only two-thirds as large as in 1978—the low attainment and achievement of black and Hispanic students remain disturbing evidence of educational inequality in our society. Our future prosperity depends on ensuring that American children from all backgrounds have the opportunity to become productive workers.

Nowhere does low performance more acutely affect the health of the U.S. economy than in the areas of science, technology, engineering, and mathematics (known commonly by the acronym STEM). Employers frequently report that they have difficulty finding Americans with the qualifications needed for technical jobs and are forced to look abroad for suitably skilled workers. Indeed, international comparisons show that other countries achieve higher outcomes in STEM skills than we do. In

Figure 8-8  
Long-Term Trend Math Performance



Notes: In 2004 and thereafter, accommodations were made available for students with disabilities and for English language learners, and other changes in test administration conditions were introduced. Dashed lines represent data from tests given under the new conditions.

Source: Department of Education (Institute of Education Sciences, National Center for Education Statistics), National Assessment of Educational Progress (NAEP), Long-Term Trend Mathematics Assessments.

2006, U.S. 15-year-olds scored well below the Organisation for Economic Co-operation and Development (OECD) average for science literacy on the Programme for International Student Assessment, and behind most other OECD nations on critical skills and competencies, such as explaining scientific phenomena and using scientific evidence.

## A PATH TOWARD IMPROVED EDUCATIONAL PERFORMANCE

Concerned about the impact of stagnating educational outcomes on U.S. economic growth, the President has pledged to return our Nation to the path of increasing educational attainment. He has challenged every young American to commit to at least one year of higher education or career training. He also has set ambitious goals: by 2020, America should “once again have the highest proportion of college graduates in the world” (Obama 2009a), and U.S. students should move “from the middle to the top

of the pack in science and math” (Obama 2009b). Meeting these challenges will require substantial commitment and reform, not just at the postsecondary level but also in elementary and high schools and even in early childhood programs.

### *Postsecondary Education*

The Nation’s postsecondary education system encompasses a diverse group of institutions, including public, nonprofit, and for-profit organizations offering education ranging from short-term skill refresher programs up to doctoral degrees.

In many of our peer countries, postsecondary education is entirely or largely state funded, with little direct cost to the student. U.S. postsecondary students, however, are generally charged tuition and fees, which have risen substantially in real terms over the past three decades. It is important to keep in mind that most of our students do not pay full tuition, as more than 60 percent of full-time students receive grant aid, and millions more also benefit from Federal tax credits and deductions for tuition. But increases in financial aid and Federal assistance have not kept up with rising costs, and the net price of attendance at four-year public colleges has risen nearly 20 percent over the past decade (College Board 2009).

Young people may have trouble financing expensive investments in college education even when these investments will pay off through increased long-term earnings. Thus, rising college costs represent an important barrier to enrollment. One study indicates that a \$1,000 reduction in net college costs increases the probability of attending college by 5 percentage points and leads students to complete about one-fifth of a year more college (Dynarski 2003). Thus the dramatic increase in the price of college has likely had an adverse impact on college attendance and completion. Moreover, the impact of cost increases is not evenly distributed: while students from high-income families can relatively easily absorb the increases, students from lower-income families are disproportionately deterred.

The rising cost of college is affecting educational attainment and will continue to do so unless we find ways to make college more affordable. To this end, the Administration has secured historic investments in student aid, including more than \$100 billion over the next 10 years for more generous Pell Grants, much of it financed through the elimination of wasteful subsidies to private lenders in the student loan program. This will ensure that virtually all students eligible for Pell Grants will receive larger awards. In addition, the Administration is taking steps to dramatically simplify the student aid application process, the complexity of which deters

many aid-eligible students from even applying. This simplification will help millions more students benefit from the Federal investments in college accessibility and affordability.

Tuition is not the only barrier to college completion. A great many students, including nearly half of those at two-year institutions, begin college but fail to graduate. Completion rates are particularly low for low-income students. One way to raise completion rates is through better design of the institutional environment. Recent rigorous studies have shown that improvements such as enhanced student services, changes in how classes are organized, innovations in how remedial education is structured, and basing some portion of financial aid on student performance can all contribute to improved persistence (Scrivener et al. 2008; Scrivener, Sommo, and Collado 2009; Richburg-Hayes et al. 2009).

### ***Training and Adult Education***

An often-overlooked component of the Nation's education system, one in which the government makes a major investment, is job training and adult education. In 2009, the Federal Government devoted more than \$17 billion to job training and employment services and spent substantial additional funds on Pell Grants for vocational and adult education students. Training is provided by a diverse set of institutions, including proprietary (for-profit) schools, four-year colleges, community-based organizations, and public vocational and technical schools. Box 8-2 discusses a particularly important type of training provider, community colleges.

Studies have documented that training and adult education programs improve participants' labor market outcomes. For example, a recent study found that Workforce Investment Act training programs for adults boosted employment and earnings, on average, although results varied substantially across states (Heinrich, Mueser, and Troske 2008). Evidence is also growing that state training programs for adults can have large positive impacts on long-term earnings (Hotz, Imbens, and Klerman 2006; Dyke et al. 2006).

Education and training for adults play critical roles in helping displaced workers regain employment in the short term and in helping them obtain and refresh their skills in the face of an ever-changing workplace. For example, one study of displaced workers in Washington State suggests that attending a community college after displacement during the 1990s increased long-term earnings about 9 percent for men and about 13 percent for women (Jacobson, LaLonde, and Sullivan 2005). The benefits were greatest for academic courses in math and science, as well as for courses related to the health professions, technical trades (such as air conditioner repair), and technical professions (such as software development).

Although research demonstrates the value of training programs, there is no doubt that the current system could be more effective. Five strategies that could improve effectiveness are: aligning goals across different elements of the education and training system and constructing a cumulative curriculum; collaborating with employers to ensure that curricula are aligned with workforce needs and regional economies; making sure that scheduling is flexible and that curricula meet the needs of older and nontraditional students; providing incentives and flexibility for institutions and programs to continually improve and innovate; and establishing a stronger accountability system that measures the right things, makes performance data available in an easily understood format, and does not create perverse incentives to avoid serving populations that most need assistance. Reauthorization of the Workforce Investment Act will provide an opportunity to implement these strategies.

**Box 8-2: Community Colleges: A Crucial Component of Our Higher Education System**

Community colleges are an important but often overlooked component of the Nation’s postsecondary education system. These colleges may offer academic programs preparing students to transfer to four-year colleges to complete bachelor’s degrees, academic and vocational programs leading to terminal associate’s degrees or certificates, remedial education for those who want to attend college but who left high school insufficiently prepared, and short-term job training or other educational experiences. Most also offer contract training in which they work directly with the public sector, employers, and other clients (such as prisons) to develop and provide training for specific occupations or purposes.

Community colleges are public institutions that typically charge very low tuition and primarily serve commuters, which makes them accessible to people who do not have the resources for a four-year college. They generally have “open door” admissions policies, requiring only a high school diploma or an ability to benefit from the educational experience. This makes them a good choice for older and nontraditional students, as well as for potential students who want to pursue additional education and build their human capital but want or need to do so at relatively low cost.

More than 35 percent of first-time college freshmen enroll at community colleges. These colleges also serve about 35 percent of individuals receiving job training through the Workforce Investment Act, along with a notable proportion of adults attending adult basic education, English as a second language, and General Educational Development

*Continued on next page*

*Box 8-2, continued*

(GED) preparation classes. Researchers have estimated that attending a community college significantly raises earnings, even for individuals who do not complete degrees (Kane and Rouse 1999; Marcotte et al. 2005).

Community colleges will form the linchpin of efforts to increase college attendance and graduation rates. The Administration has proposed a new program of competitive grants for implementing college completion initiatives, with a focus on community colleges. Along with the sorts of strategies mentioned above for training programs more generally, community college initiatives could include building better partnerships between colleges, businesses, the workforce investment system, and other workforce partners to create career pathways for workers; expanding course offerings including those built on partnerships between colleges and high schools; and stronger accountability for results. These strategies will help both to strengthen colleges and to raise completion rates. The proposed program also recognizes the need to learn from such investment and therefore supports record levels of funding for research to evaluate the initiatives' effectiveness.

### ***Elementary and Secondary Education***

Students who leave high school with inadequate academic preparation face greater challenges to success in postsecondary training. In 2001, nearly one-third of first-year college students in the United States needed to take remedial classes in reading, writing, or mathematics, at an estimated cost of more than \$1 billion (Bettinger and Long 2007). The need for remediation is a clear warning sign that a student may later drop out. In one study, students who needed the most remediation were only about half as likely to complete college as their peers who were better prepared (Adelman 1998). Of course, students who leave high school well prepared are more successful in the labor market as well as in college.

The task of improving college and labor market preparedness begins in elementary and secondary school, if not earlier. Among the most important contributors to enhanced student outcomes is effective teaching. Common sense and research both recognize the importance of high-quality teachers, and yet too few teachers reach that standard. Improvements are needed in teacher training, recruitment, evaluation, and in-service professional development.

Not only is the supply of high-quality teachers insufficient but their distribution across schools is inequitable. Frequently, schools with high

concentrations of minority and low-income students, the very schools that need quality teachers the most, cannot recruit and retain skilled educators. In New York State, 21 percent of black students had teachers who failed their general knowledge certification exam on the first attempt, compared with 7 percent of white students (Lankford, Loeb, and Wyckoff 2002). A particular problem is high teacher turnover: high-poverty and high-minority schools have much higher turnover than do schools with more advantaged students. Some districts have begun experimenting with financial incentives for teaching in high-need schools; these efforts need to be rigorously evaluated and, if they are found to be successful, disseminated widely.

Improving teacher quality, however, is not the only promising strategy for change. Others include extending both the school day and the school year. Many successful strategies have emerged from schools that were given freedom to explore new and creative approaches to long-standing problems. Although traditional public schools can be agents for change, the public charter school model is tailor-made for such innovation. The Nation's experience with charter schools has been fairly brief, but evidence to date suggests that some of these schools have found successful strategies for raising student achievement. An important future challenge will be to take these strategies and other innovative school models to scale, even as schools continue to search for ever-better approaches.

Although most reforms in recent years have focused on elementary schools, high school reform is now rising to the top of the education policy agenda. Promising approaches to improving secondary education include programs that offer opportunities for accelerated instruction and individualized learning, programs to expand access to early college coursework before finishing high school, residential schools for disadvantaged students, and specialty career-focused academies.

An environment that supports innovation must be coupled with strong accountability. Some innovations are bound to be unsuccessful, and indeed there is substantial variation in the quality of both public and charter schools. Strong accountability systems that promote effective instructional approaches can provide incentives for all school stakeholders to perform at their best and help to identify struggling schools in need of intervention. Systems are needed to identify failing schools, based on high-quality student assessments as well as other metrics. At the same time, accountability strategies must be carefully crafted to discourage “teaching to the test” and other approaches that aim at the measures used for evaluating schools rather than at true student learning. Accountability strategies must also recognize that student achievement reflects family, community, and peer influences as well as that of the school.

Providing incentives for schools identified as failing to improve can significantly improve student outcomes. Several states have done just that. Sixteen years ago, Massachusetts began setting curriculum frameworks and holding schools accountable for student performance. Massachusetts students have historically scored above the national average on various academic achievement measures, but since passing school accountability reform, Massachusetts has moved even farther ahead. In Florida, too, a strong school accountability plan, implemented in 1999, has shown positive results (Figlio and Rouse 2006; Rouse et al. 2007).

The Recovery Act included an unprecedented Federal investment in elementary and secondary education. The Race to the Top Fund provides competitive grants to reward and encourage states that have taken strong measures to improve teacher quality, develop meaningful incentives, incorporate data into decisionmaking, and raise student achievement in low-achieving schools. The upcoming reauthorization of the Elementary and Secondary Education Act provides an opportunity to make further progress.

### *Early Childhood Education*

High-quality elementary and secondary schools are necessary, but they are not enough. In recent years, researchers and educators have learned a great deal about how important the school readiness of entering kindergarteners is to later academic and labor market success. School readiness involves both academic skills, as measured by vocabulary size, complexity of spoken language, and basic counting, and social and emotional skills such as the ability to follow directions and self-regulate. Children who arrive at school without these skills lack the foundation on which later learning will build.

Recent research indicates that as many as 45 percent of entering kindergarteners are ill-prepared to succeed in school (Hair et al. 2006). Reducing the share of at-risk preschoolers is critical to strengthening America's educational system and its labor market in the long run. High-quality early childhood interventions can significantly improve school readiness, especially for low-income children. Intensive programs that combine high-quality preschool with home visits and parenting support have been shown to raise children's later test scores and educational attainment and also to reduce teen pregnancy rates and criminality (Karoly et al. 1998; Schweinhart et al. 1985).

The programs on which the most compelling research is based include small classes, highly educated teachers with training in early childhood education, and stimulating curricula. They feature parent training

components that help parents reinforce what the teachers do in the classroom. The programs also assist teachers in identifying health and behavior problems that can inhibit children's intellectual and emotional development. Importantly, even intensive, expensive programs are cost-effective. For example, one particularly intensive program was found to produce \$2.50 in long-run savings for taxpayers for every dollar spent, because in adulthood the participating children earned higher incomes, used fewer educational and government resources, and had lower health care costs (Barnett and Masse 2007).

Less intensive programs can be effective as well. The Head Start program provides an academically enriching preschool environment for 3- and 4-year-olds, at a cost in 2008 of only about \$7,000 per child per year. Although the quality of Head Start centers varies widely, studies have found that attendance at a well-run center improves children's later-life outcomes (Currie and Thomas 1995).

Ensuring that all families have access to the services and support they need to help prepare their children for kindergarten will require a strong system of high-quality preschools and other early-learning centers. Providers must be held to high standards and given the resources—including qualified staff and teachers—needed for success. And when children leave their preschool and prekindergarten programs, they must have access to quality kindergartens that ease the transition to elementary school.

## CONCLUSION

The recession has taken a severe toll on American workers and many will continue to suffer from its effects for some time to come. A strong safety net will be essential to helping working families through this trying time. As the economy strengthens, we must rebuild our labor market institutions in ways that ensure that prosperity and economic security are more widely shared.

Going forward, workers who have strong analytic and interactive skills will be best able to secure good jobs and to contribute to continued U.S. prosperity. Education must begin in preschool, because children's long-run success depends on arriving in kindergarten ready to learn, and be available throughout adulthood, because our increasingly dynamic economy requires lifelong learning. The Administration's education agenda will strengthen our education and training institutions at all levels.



## C H A P T E R 9

# TRANSFORMING THE ENERGY SECTOR AND ADDRESSING CLIMATE CHANGE

The President has called climate change “one of the defining challenges of our time.” If steps are not taken to reduce atmospheric concentrations of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases, scientists project that the world could face a significant increase in the global average surface temperature. Projections indicate that CO<sub>2</sub> concentrations may double from pre-industrial levels as early as 2050, and that the higher concentrations are associated with a likely long-run temperature increase of 2 to 4.5 °C (3.6 to 8.1 °F). With temperatures at that level, climate change will lead to a range of negative impacts, including increased mortality rates, reduced agricultural yields in many parts of the world, and rising sea levels that could inundate low-lying coastal areas.

The planet has not experienced such rapid warming on a global scale in many thousands of years, and never as a result of emissions from human activity. By far the largest contribution to this warming comes from carbon-intensive fossil fuels, which the world depends on for cooking, heating and cooling homes and offices, transportation, generating electricity, and manufacturing products such as cement and steel.

The potential for significant damages if emissions from these activities are not curbed makes it crucial for the world to transform the energy sector. This transformation will entail developing entirely new industries and making major changes in the way energy is produced, distributed, and used. New technologies will be developed and new jobs created. The United States can play a leadership role in these efforts and become a world leader in clean energy technologies. The transformation to a clean energy economy will also reduce our Nation’s dependence on oil and improve national security, and could reduce other pollutants in addition to greenhouse gases.

As this transformation unfolds, two market failures provide a motivation for government policy. First, greenhouse gas emissions are a

classic example of a negative externality. As emitters of greenhouse gases contribute to climate change, they impose costs on others that are not taken into account when making decisions about how to produce and consume energy-intensive goods. Second, the development of new technologies has positive externalities. As discussed in Chapter 10, the developers of new technologies generally capture much less than the full benefit of their ideas to consumers, firms, and future innovators, and thus underinvest in research and development.

This diagnosis of the market failures underlying climate change provides clear guidance about the role of policy in the area. First, policy should take steps to ensure that the market provides the correct signals to greenhouse gas emitters about the full cost of their emissions. Second, policy should actively promote the development of new technologies. One way to accomplish these goals is through a market-based approach to reducing greenhouse gases combined with government incentives to promote research and development of new clean energy technologies. Once policy has ensured that markets are providing the correct signals and incentives, the operation of market forces can find the most effective and efficient paths to the clean energy economy. The Administration's policies in this area are guided by these principles.

## **GREENHOUSE GAS EMISSIONS, CLIMATE, AND ECONOMIC WELL-BEING**

The world's dependence on carbon-intensive fuels is projected to continue to increase global average temperature as greenhouse gas emissions build in the atmosphere. These emissions are particularly problematic because many are long-lived: for instance, it will take a century for slightly more than half of the carbon dioxide now in the atmosphere to be naturally removed. The atmospheric buildup of greenhouse gases since the start of the industrial revolution has already raised average global temperature by roughly 0.8 °C (1.4 °F). If the concentrations of all greenhouse gases and aerosols resulting from human activity could somehow be kept constant at current levels, the temperature would still go up about another 0.4 °C (0.7 °F) by the end of the century. It is important to note that the overall impact of today's emissions would be even higher were it not for the offsetting net cooling effect of increases in atmospheric aerosols such as particulate matter caused by the incomplete combustion of fossil fuels in coal-fired power plants.

But keeping atmospheric concentrations constant at today's level is virtually impossible. Any additional greenhouse gas emissions contribute

to atmospheric concentrations. And because of projected economic growth, particularly in developing countries, greenhouse gas emissions will continue to grow. Moreover, the sources of atmospheric aerosols that have partly offset the greenhouse warming experienced so far are not likely to grow apace because governments around the world are taking actions to curb these emissions to improve public health and control acid rain.

### ***Greenhouse Gases***

The principal long-lived greenhouse gases whose concentrations have been affected by human activity are carbon dioxide, methane, nitrous oxide, and halocarbons. Sulfur hexafluoride, though emitted in smaller quantities, is also a very potent greenhouse gas. All have increased significantly from pre-industrial levels. Carbon dioxide is emitted when fossil fuel is burned to heat and cool homes, fuel vehicles, and manufacture products such as cement and steel. Deforestation also releases carbon dioxide stored in trees and soil. The primary sources of methane and nitrous oxide are agricultural practices, natural gas use, and landfills. Halocarbons originate from refrigeration and industrial processes, while sulfur hexafluoride emissions mainly stem from electrical and industrial applications.

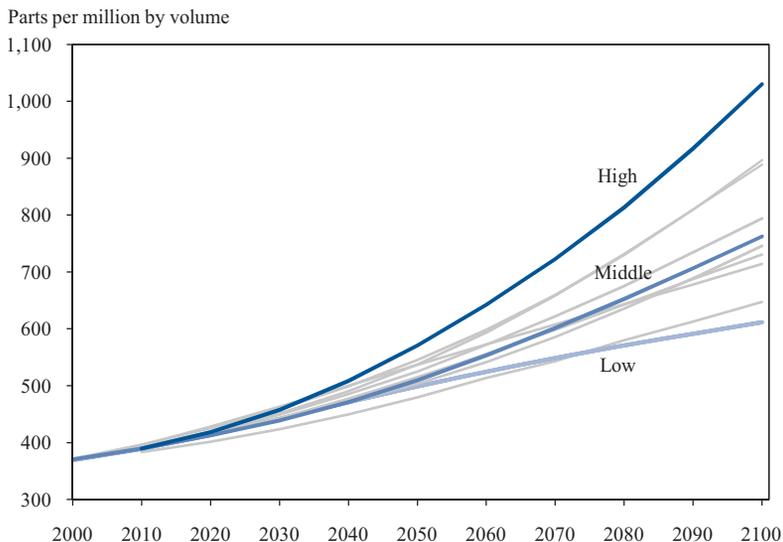
The pre-industrial atmospheric concentration of carbon dioxide was about 280 parts per million (ppm), meaning that 280 out of every million molecules of gas in the atmosphere were carbon dioxide. As of December 2009, its concentration had increased to about 387 ppm. Taking into account other long-lived greenhouse gases would result in a higher warming potential, but the net cooling effect of aerosols that have been added by humans to the atmosphere nearly cancels the effect of those other gases. Thus, the overall effect of human activity on the atmosphere to date is (coincidentally) about the same as that of the carbon dioxide increase alone.

A variety of models project that, absent climate policy, atmospheric concentrations of carbon dioxide will continue to grow, reaching levels ranging from 610 to 1030 ppm by 2100 (Figure 9-1). When the warming effects of other long-lived greenhouse gases are included, this range is equivalent to 830 to 1530 ppm. The breadth of the range reflects uncertainty about future energy supply, energy demand, and the future behavior of the carbon cycle.<sup>1</sup>

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<sup>1</sup> Underlying uncertainty about future energy supply is uncertainty regarding the costs and penetration rates of technology, and resource availability. Uncertainty about future energy demand is driven by uncertainty regarding growth in population, gross domestic product, and energy efficiency.

Figure 9-1  
Projected Global Carbon Dioxide Concentrations with No Additional Action



Note: The figure shows baseline projections from 10 different models, with the models that produce the highest, middle, and lowest atmospheric concentration of carbon dioxide in 2100 noted.

Source: Stanford Energy Modeling Forum, EMF 22 International Scenarios, 2009.

## Temperature Change

The implications of large increases in greenhouse gas concentrations for temperature change are quite serious. There is a consensus among scientists that a doubling of CO<sub>2</sub> concentrations (or any equivalent combination of greenhouse gases) above the pre-industrial level of 280 ppm is likely to increase global average surface temperature by 2 to 4.5 °C (3.6 to 8.1 °F), with a best estimate of about 3 °C (5.4 °F).<sup>2</sup> Given much higher projections of greenhouse gas concentrations by the end of the century, a recent study projects that the global average temperature in 2100 is likely to be 4.2 to 8.1 °C (7.6 to 14.6 °F) above pre-industrial levels, absent effective policies to reduce emissions (Webster et al. 2009).

Increases in global average temperature mask variability by region. For instance, absent effective policy to reduce greenhouse gas emissions, mid-continent temperature increases are likely to be about 30 to 60 percent higher than the global average, while increases in parts of the far North (for instance, parts of Alaska, northern Canada, and Russia) are expected to be double the global average. The power of the strongest hurricanes and

<sup>2</sup> These values express what is likely to happen in equilibrium. Average surface temperature does not reach a new equilibrium for some decades after any given increase in the concentration of heat-trapping gases because of the large thermal inertia of the oceans.

typhoons is likely to grow, as are the frequency and intensity of extreme weather events such as heat waves, heavy precipitation, floods, and droughts. One study, for example, estimates that the number of days that mean temperature (calculated as the average of the daily minimum and daily maximum) in the United States will exceed 90 °F will increase from about one day a year between 1968 and 2002 to over 20 days a year by the end of the century (Deschênes and Greenstone 2008).

As the increase in global average temperature warms seawater and expands its volume, sea levels are projected to rise. Melting glaciers also contribute to sea-level rise. Sea level has already risen about 0.6 feet since 1900; it is projected to rise another 0.6 to 1.9 feet because of volume expansion and glacial melt by the end of the century. These estimates exclude possible rapid ice loss from the Greenland and Antarctic ice sheets, events that are highly uncertain but that could cause another 2 feet or more of sea level rise by 2100. Without expensive adaptation, low-lying land in coastal areas around the world could become permanently flooded as a result.

### ***Impact on Economic Well-Being***

Although predicting future economic impacts associated with increases in global average temperature involves a large degree of uncertainty, these economic effects are likely to be significant and largely negative, and to vary substantially by region. Even for countries that may be less vulnerable, large negative economic impacts in other regions will inevitably jeopardize their security and well-being. For instance, the temperature extremes and other changes in climate patterns associated with global average temperature increases of 2 °C (3.6 °F) or more are projected to increase mortality rates and reduce agricultural productivity in many regions, threaten the health and sustainability of many ecosystems, and necessitate expensive measures to adapt to these changes. Box 9-1 discusses recent research on projected physical and economic impacts in the United States.

Some regions of the world are expected to be particularly hard-hit. For example, low-lying and island countries are especially vulnerable to sea-level rise. Further, developing countries, especially those outside moderate temperature zones, may be especially poorly equipped to confront temperature changes. Recent research, for example, suggests that India may experience substantial declines in agricultural yields and increases in mortality rates (Guiteras 2009; Burgess et al. 2009).

These projected changes are predicated on likely increases in global mean temperature. Particularly worrisome is the possibility of much greater temperature change, should more extreme projections prove accurate. Although more drastic increases are less likely, their consequences could be

devastating. For example, the costs of climate change are expected to grow nonlinearly (that is, more rapidly) as temperatures rise (Box 9-2).

In the United States, continued reliance on petroleum-based fuels poses challenges that go beyond climate change. It makes the economy susceptible to potentially costly spikes in crude oil prices and imposes significant national security costs. A panel of retired senior military officers and national security experts concluded that unabated climate change may act as a “threat multiplier” to foment further instability in some of the world’s most unstable regions (CNA Corporation 2007). Fossil fuel consumption is also associated with other forms of pollution that harm human health, such as particulate, sulfur dioxide, and mercury emissions from coal-powered electricity generation.

### **Box 9-1: Climate Change in the United States and Potential Impacts**

The average temperature in the United States has risen more than 1 °C (2 °F) over the past 50 years. However, this increase masks considerable regional variation. For instance, the temperature increase in Alaska has been more than twice the U.S. average. By the end of the century, the United Nations Intergovernmental Panel on Climate Change projects that average continental U.S. temperatures will increase by another 1.5 to 4.5 °C (about 2.7 to 8.1 °F) absent climate policy (Intergovernmental Panel on Climate Change 2007). Greater increases are possible, depending in part on how fast emissions rise over time. Climate change will likely bring substantial changes to water resources, energy supply, transportation, agriculture, ecosystems, and public health. Potential effects on U.S. water availability and agriculture are described below (Karl, Melillo, and Peterson 2009).

Precipitation already has increased an average of 5 percent over the past 50 years, with increases of up to 25 percent in parts of the Northeast and Midwest and decreases of up to 20 percent in parts of the Southeast. In the future, these trends will likely be amplified. The amount of rain falling in the heaviest downpours has increased an average of 20 percent over the past century, a trend that is expected to continue. In addition, Atlantic hurricanes and the strongest cold-season storms in the North are likely to become more powerful. In recent decades, the West has seen more droughts, greater wildfire frequency, and a longer fire season. Increases in temperature and reductions in rainfall frequency will likely exacerbate future droughts and wildfires.

*Continued on next page*

*Box 9-1, continued*

Although warmer temperatures may extend the growing season in the United States for many crops, large increases in temperature also may harm growth and yields. One study finds that yields are relatively unaffected by changes in mean temperature, but that they are vulnerable to an increase in the number of very hot days (Schlenker and Roberts 2009). That said, another study finds that expected changes in temperature in the United States will have a relatively small impact on overall agricultural profits (Deschênes and Greenstone 2007). Neither study accounts for the possible increase in yields from elevated carbon dioxide levels or the possible decrease in yields from increased pests, weeds, and disease.

Climate change is also likely to bring increased weather uncertainty. Extreme weather events—droughts and downpours—may have catastrophic effects on crops in some years. Growing crops in warmer climates requires more water, which will be particularly challenging in regions such as the Southeast that will likely face decreased water availability.

American farmers have substantial capacity for innovation and are already taking steps to adapt to climate change. For instance, they are changing planting dates and adopting crop varieties with greater resistance to heat or drought. They can also undertake more elaborate change. In areas projected to become hotter and drier, some farmers have returned to dryland farming (instead of irrigation) to help the soil absorb more moisture from the rain. How well the private sector can adapt to the effects of climate change and at what cost is still an open question.

**Box 9-2: Expected Consumption Loss Associated with Temperature Increase**

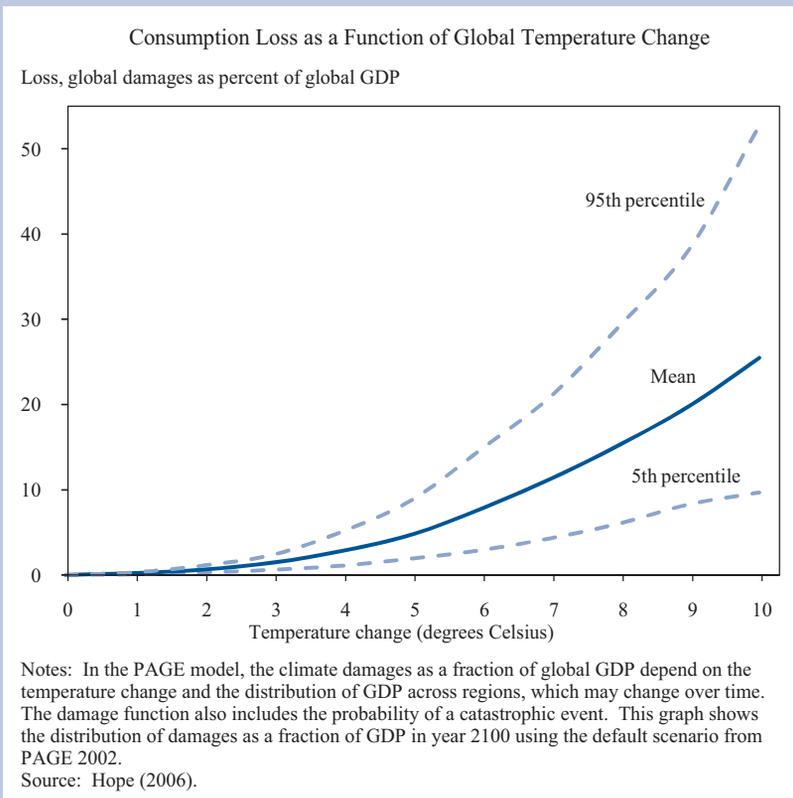
One major uncertainty regarding climate change is the relationship between temperature change and living standards, usually measured as total consumption. The highly respected PAGE model produces an estimate of this relationship (see Box 9-2 figure). Specifically, it reports the expected decline in consumption as a fraction of GDP in the year 2100. The range of these estimates is represented by the dotted lines that represent the 5th and 95th percentile of the damage estimates. The range reflects uncertainty about the sensitivity of the climate system to increased greenhouse gas concentrations, the probability of catastrophic events, and several other factors.

*Continued on next page*

Box 9-2, continued

The figure reveals that the projected losses for the most likely range of temperature changes are relatively modest. For example, at the Intergovernmental Panel on Climate Change's most likely temperature increase of 3 °C for a doubling of CO<sub>2</sub> concentration (concentrations in 2100 are likely to be higher), the projected decline is 1.5 percent of GDP.

The projected relationship between temperature changes and consumption losses is nonlinear—that is, the projected losses grow more rapidly as temperature increases. For example, while the projected loss for the first 3 °C is 1.5 percent, the loss at 6 °C is five times higher. And the estimated loss associated with an increase of 9 °C is about 20 percent with a 90 percent confidence interval of 8 to 38 percent. These large losses at higher temperatures reflect the increased probability of especially harmful events, such as large-scale changes in ice sheets or vegetation, or releases of methane from thawing permafrost and warming oceans. Overall, it is evident that policy based on the most likely outcomes may not adequately protect society because such estimates fail to reflect the harms at higher temperatures.



## JUMP-STARTING THE TRANSITION TO CLEAN ENERGY

To make the transition to a clean energy economy, the United States and the rest of the world need to reduce their reliance on carbon-intensive fossil fuels. The American Reinvestment and Recovery Act of 2009 provides a jump-start to this transition by providing about \$60 billion in direct spending and \$30 billion in tax credits (Council of Economic Advisers 2010). These Recovery Act investments were carefully chosen and provide a soup-to-nuts approach across a spectrum of energy-related activities, ranging from taking advantage of existing opportunities to improve energy efficiency to investing in innovative high-technology solutions that are currently little more than ideas. These investments will help create a new generation of jobs, reduce dependence on oil, enhance national security, and protect the world from the dangers of climate change. Ultimately, the investments will put the United States on a path to becoming a global leader in clean energy.

### *Recovery Act Investments in Clean Energy*

A market-based approach to reducing greenhouse gases (discussed in detail later) will provide incentives for research and development (R&D) into new clean energy technologies as firms search for ever cheaper ways to address the negative externality associated with their emissions. However, as already described, there is a separate externality in the area of R&D. Because it is difficult for the person or firm doing research to capture all of the returns, the private market supplies too little R&D—particularly for more basic forms of R&D, less so as ideas move toward demonstration and deployment. In this case, government R&D policies can complement the use of a market-based approach to reducing greenhouse gas emissions and yield large benefits to society. A policy that broadly incentivizes energy R&D is more likely to maximize social returns than a narrow one targeted at a specific technology because it allows the market, rather than the government, to pick winners. Likewise, funding efforts in support of basic R&D are less likely to crowd out private investment because differences between private and social returns to innovation are largest for basic R&D.

In its 2011 proposed budget, the Administration has stated a commitment to fund R&D as part of its comprehensive approach to transform the way we use and produce energy while addressing climate change. The Recovery Act investments begun in 2009 are a first step in this clean energy transformation. They fall into eight categories that are briefly described here.

**Energy Efficiency.** The Recovery Act promotes energy efficiency through investments that reduce energy consumption in many sectors of the economy. For instance, the Act appropriates \$5 billion to the Weatherization Assistance Program to pay up to \$6,500 per dwelling unit for energy efficiency retrofits in low-income homes. The Recovery Act also appropriates \$3.2 billion to the Energy Efficiency and Conservation Block Grant program, most of which will go to U.S. states, territories, local governments, and Indian tribes to fund projects that improve energy efficiency, reduce energy use, and lower fossil fuel emissions.

**Renewable Generation.** The Recovery Act investments in renewable energy generation also are leading to the installation of wind turbines, solar panels, and other renewable energy sources. The Energy Information Administration projects that the fraction of the Nation's electricity generated from renewable energy, excluding conventional hydroelectric power, will grow from 3 percent in 2008 to almost 7 percent in 2012 in large part because of the renewal of Federal tax credits and the funding of new loan guarantees for renewable energy through the Recovery Act (Department of Energy 2009a).

**Grid Modernization.** As the United States transitions to greater use of intermittent renewable energy sources such as wind and solar, the Recovery Act is financing the construction of new transmission lines that can support electricity generated by renewable energy. The Act is also investing in new technologies that will improve electricity storage capabilities and the monitoring of electricity use through "smart grid" devices, such as sophisticated electric meters. These investments will improve the reliability, flexibility, and efficiency of the Nation's electricity grid.

**Advanced Vehicles and Fuels Technologies.** The Recovery Act is funding research on and deployment of the next generation of automobile batteries, advanced biofuels, plug-in hybrids, and all-electric vehicles, as well as the necessary support infrastructure. These efforts are expected to reduce the Nation's dependence on oil in the transportation sector.

**Traditional Transit and High-Speed Rail.** Grants from the Recovery Act also will help upgrade the reliability and service of public transit and conventional intercity railroad systems. For example, \$8 billion is going to improve existing, or build new, high-speed rail in 100- to 600-mile intercity corridors. Investments in high-speed rail and public transit will increase energy efficiency by improving both access and reliability, thus making it possible for more people to switch to rail or public transit from autos or other less energy-efficient forms of transportation.

**Carbon Capture and Storage.** One approach to limiting greenhouse gas emissions is to capture and store carbon from fossil-fuel combustion to

keep it from entering the atmosphere. The abundance of coal reserves in the United States makes developing such technologies and overcoming barriers to their use a particular priority. For instance, technology to capture carbon dioxide emissions has been used in industrial applications but has not been used on a commercial scale to capture emissions from power generation. Likewise, although some carbon has been stored deep in the ocean or underground in depleted oil reservoirs, questions remain about the permanence of these and other types of storage. The Recovery Act is funding crucial research, development, and demonstration of these technologies.

***Innovation and Job Training.*** The Recovery Act is also investing in the science and technology needed to build the foundation for the clean energy economy. For instance, a total of \$400 million has been allocated to the Advanced Research Projects Agency-Energy (ARPA-E) program, which funds creative new research ideas aimed at accelerating the pace of innovation in advanced energy technologies that would not be funded by industry because of technical or financial uncertainty. The Recovery Act also helps fund the training of workers for jobs in the energy efficiency and clean energy industries of the future.

***Clean Energy Equipment Manufacturing.*** The Recovery Act investments are increasing the Nation's capacity to manufacture wind turbines, solar panels, electric vehicles, batteries, and other clean energy components domestically. As the United States transitions away from fossil fuels, demand for advanced energy products will grow, and these investments in clean energy will help American manufacturers participate in supplying the needed goods.

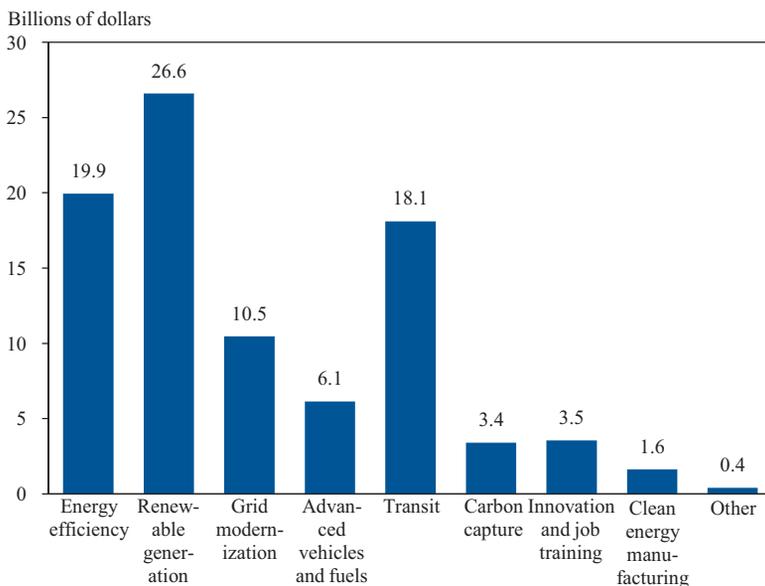
***Total Recovery Act Energy Investments.*** The Recovery Act is investing in 56 projects and activities that are related to transitioning the economy to clean energy. Forty-five are spending provisions with a total appropriation of \$60.7 billion, and another 11 are tax incentives that the Office of Tax Analysis estimates will cost \$29.5 billion through fiscal year 2019, for a total investment of over \$90 billion. In some cases, a relatively small amount of Federal investment leverages a larger amount of non-Federal support. Throughout this section, only the expected subsidy cost of the Federal investment is counted toward the appropriation.<sup>3</sup>

The largest clean energy investments from the Recovery Act go to renewable energy generation and transmission, energy efficiency, and transit. Figure 9-2 illustrates how this \$90 billion investment is distributed across the eight categories of projects described above, along with a ninth "other" category containing programs that do not fit elsewhere.

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<sup>3</sup> Because of the public nature of the Bonneville and Western Area Power Administrations, the accounting of clean energy investments described here measures the projected drawdown of the borrowing authority to these agencies as the Recovery Act appropriation.

Figure 9-2  
Recovery Act Clean Energy Appropriations by Category



Source: Council of Economic Advisers (2010).

Because most of the clean energy investments involve grants and contracts that require that proposals be reviewed before funds are expended, not all of the money appropriated for these investments could be spent immediately. Thus, as with the Recovery Act more generally, only a portion of the appropriation has been spent. Over \$31 billion has been obligated and over \$5 billion has been outlayed through the end of 2009.<sup>4</sup>

### ***Short-Run Macroeconomic Effects of the Clean Energy Investments***

Using a macroeconomic model, the Council of Economic Advisers (CEA) estimates that the approximately \$90 billion of Recovery Act investments will save or create about 720,000 job-years by the end of 2012 (a job-year is one job for one year). Projects in the renewable energy generation and transmission, energy efficiency, and transit categories create the most job-years. Approximately two-thirds of the job-years represent work on clean energy projects, either by workers employed directly on the projects or by workers at suppliers to the projects. These macroeconomic benefits make it clear that the Administration has made a tremendous down payment on the clean energy transformation.

<sup>4</sup> *Obligated* means that the money is available to recipients once they make expenditures, and *outlayed* means the government has reimbursed recipients for their expenditures. Energy-related tax reductions to date are included in the totals obligated and outlayed by the end of 2009.

## OTHER DOMESTIC ACTIONS TO MITIGATE CLIMATE CHANGE

In his first year in office, the President took several other significant and concrete steps to transform the energy sector and address climate change. Significantly, the Environmental Protection Agency (EPA) issued two findings in December 2009. The first finding was that six greenhouse gases endanger public health and welfare. The second finding was that the emissions of these greenhouse gases from motor vehicles cause or contribute to pollution that threatens public health and welfare. These findings do not in and of themselves trigger any requirements for emitters, but they lay the foundation for regulating greenhouse gas emissions.

Following up on these findings, the Administration has proposed the first mandatory greenhouse gas emission standards for new passenger vehicles. The standards are expected to be finalized in the spring of 2010. By model year 2016, new cars and light trucks sold in the United States will be required to meet a fleet-wide tailpipe emissions limit equivalent to a standard of about 35.5 miles per gallon if met entirely through fuel economy improvements. The EPA estimates that these standards will save about 36 billion gallons of fuel and reduce vehicle greenhouse gas emissions by about 760 million metric tons in CO<sub>2</sub>-equivalent terms over the lifetime of the vehicles.

The Administration also proposed renewable fuel standards consistent with the Energy Independence and Security Act (EISA), which requires that a minimum volume of renewable fuel be added to gasoline sold in the United States. Renewable fuels are derived from bio-based feedstocks such as corn, soy, sugar cane, or cellulose that have fewer life-cycle greenhouse gas emissions than the gasoline or diesel they replace. When fully implemented, the standards will increase the volume of renewable fuel blended into gasoline from 9 billion gallons in 2008 to 36 billion gallons by 2022.

The Administration also has been proactive in establishing minimum energy efficiency standards for a wide variety of consumer products and commercial equipment. For instance, standards were proposed or finalized in 2009 for microwave ovens, dishwashers, small electric motors, lighting, vending machines, residential water heaters, and commercial clothes washers, among others. Overall, these actions will reduce energy consumption and, in turn, greenhouse gas emissions. The Energy Information Administration's 2009 Annual Energy Outlook projected that by 2030, higher fuel economy and lighting efficiency standards will contribute to lowering energy use per capita by 10 percent, compared with fairly stable energy use per capita between 1980 and 2008 (Department of Energy

2009b). The 2010 Annual Energy Outlook highlights appliance and building efficiency standards as one reason for lower projected carbon dioxide emissions growth, underscoring the benefits of these regulations (Department of Energy 2009a).

Beginning in 2010, the United States will begin collecting comprehensive high-quality data on greenhouse gases from large emitters in many sectors of the economy (for instance, electricity generators and cement producers). When fully implemented, this program will cover about 85 percent of U.S. emissions. The information supplied will provide a basis for formulating policy on how best to reduce emissions in the future. It will also be a valuable tool to allow industry to track emissions over time. Specifically, these data will make it possible for industry and government to identify the cheapest ways to reduce greenhouse gas emissions.

Finally, the President issued an Executive Order requiring Federal agencies to set and meet aggressive goals for greenhouse gas emission reductions. Importantly, agencies are instructed to pursue reductions that lower energy expenses and save taxpayers money.

## **MARKET-BASED APPROACHES TO ADVANCE THE CLEAN ENERGY TRANSFORMATION AND ADDRESS CLIMATE CHANGE**

Greenhouse gas emissions, as noted, are a classic example of a negative externality. Emitters of greenhouse gases contribute to climate change, thus imposing a cost on others that is not accounted for when making decisions about how to produce and consume energy-intensive goods. For this reason, policymakers should ensure that the market provides the correct signals to greenhouse-gas emitters about the full cost of their emissions. Once policy has ensured that markets are providing the correct signals and incentives, the operation of market forces can find the most effective and efficient paths to the clean energy economy. The President has included a market-based cap-and-trade approach in his 2010 and 2011 budgets as a way to accomplish this goal. This section describes the basics of this approach, including several potential ways to minimize compliance costs. It then discusses a specific proposal consistent with the President's goals for reducing greenhouse gas emissions.

### ***Cap-and-Trade Program Basics***

A cap-and-trade approach sets a limit on, or caps, total annual aggregate greenhouse gas emissions and then divides the cap into

emission allowances. These allowances are allocated to firms through some combination of an auction and free allocation.<sup>5</sup> Firms may trade the allowances among themselves but are required to hold an allowance for each ton of greenhouse gas they emit. The aggregate cap limits the number of allowances available, ensuring their scarcity and thus establishing a price in the market for allowances. In this way, a cap-and-trade approach provides certainty in the quantity of emission reductions but allows the price of allowances to fluctuate with changes in the demand and supply.

Creating a market for greenhouse gas emissions gives firms flexibility in how they reduce emissions. Absent other regulatory requirements, a firm subject to the cap can choose to comply by changing its input mix (for instance, switching from coal to natural gas), modifying the underlying technology used in production (using more energy-efficient equipment, for example), or purchasing allowances from other entities with lower abatement costs. Such flexibility reaps rewards. A cap-and-trade program induces firms to seek out and exploit the lowest-cost ways of cutting emissions. It takes advantage of the profit motive and leverages private sector imagination and ingenuity to find ways to lower emissions.

Cap-and-trade programs already have proven successful. The United States has been using a cap-and-trade approach to reduce sulfur dioxide (SO<sub>2</sub>) emissions since 1995. One study found that using a cap-and-trade approach instead of a performance standard to reduce sulfur dioxide emissions caused some firms to move away from putting scrubbers on their smokestacks to cheaper ways of meeting the cap, such as by blending different fuels (Burtraw and Palmer 2004). As a result, compliance costs of the SO<sub>2</sub> cap-and-trade program have been dramatically lower than predicted.

Finally, a cap-and-trade approach promotes innovation. A carbon price will give firms the certainty they need to make riskier long-term investments that could identify novel and substantially cheaper ways to reduce emissions. Evidence shows that pricing sulfur dioxide emissions through a cap-and-trade approach has produced patentable innovations as firms search for ever cheaper ways to abate (Burtraw and Szambelan 2009).

In the case of greenhouse gases, possible innovations range from new techniques to capture and store carbon generated by coal-burning electricity plants, to carbon-eating trees and algae, to the development of new types of renewable fuels. Indeed, such innovation—and the opportunity it provides

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<sup>5</sup> In his fiscal year 2011 proposed budget, the President supports using allowance revenue to compensate vulnerable families, communities, and businesses during the transition to the clean energy economy, as well as in support of clean energy technologies and adapting to the impacts of climate change.

to make the United States a world leader in clean energy technologies—is a key motivation for the Administration’s energy and climate policies.

### *Ways to Contain Costs in an Effective Cap-and-Trade System*

There are a wide variety of ways to contain costs within a cap-and-trade framework. For instance, cap-and-trade programs may incorporate banking and borrowing of emission allowances over time, set ceilings or floors on allowance prices, or permit the use of offsets as ways to smooth the costs of compliance over time. A brief review of these mechanisms follows.

**Banking and Borrowing.** A cap-and-trade approach can be designed to give polluters flexibility in the timing of emission reductions through banking and borrowing. To limit allowance price volatility, sources can make greater reductions early if it is cheaper to do so and bank their allowances for future use. Likewise, firms can manage costs by borrowing against future reductions, allowing them to emit more today in return for more drastic reductions later.

Evidence shows that banking has played a particularly powerful role in helping firms to hedge uncertainty in the costs of the SO<sub>2</sub> cap-and-trade program over time. Anticipating that the cap originally set in 1995 would become more stringent in 2000, firms began to bank allowances for future use soon after the system was put in place. By 1999, almost 70 percent of available allowances in the market had been banked. Once the more stringent cap was in place, the banked allowances were drawn down to meet the cap, with about a 40 percent decrease in the size of the allowance bank between 2000 and 2005 (Environmental Protection Agency 2006).

In contrast, the inability of firms to bank or borrow in Southern California’s nitrous oxide market played a significant role in increased price volatility during the State’s electricity crisis in 2000 when firms met soaring demand for electricity by running old, dirty generators. One study found that the absence of banking and borrowing was an important contributing factor to the roughly tenfold increase in the price of nitrous oxide allowances, resulting in power plants subject to the cap eventually seeking exemption from the program (Ellerman, Joskow, and Harrison 2003).

**Price Ceilings or Floors.** While banking and borrowing allow firms to smooth costs over time, they may not guard against unexpected and potentially longer-lasting changes in allowance prices caused by such factors as a recession or economic boom, fuel price fluctuations, or unexpected variation in the pace of technological development. Consequently, cap-and-trade systems often include protections against prices that are deemed too high. For example, in the Northeast’s greenhouse gas trading system, allowance

prices above certain thresholds trigger additional flexibilities that reduce compliance costs.<sup>6</sup>

Another way for a cap-and-trade program to mitigate the effects of unexpected changes would be to specify an upper or lower limit, or both, on allowance prices. An upper limit protects firms and consumers from unexpectedly high prices. When the price reaches the upper limit, additional allowances are sold to prevent further escalation. A lower limit on allowance prices ensures that cheap abatement opportunities continue to be pursued. For example, cap-and-trade legislation recently passed by the U.S. House of Representatives reserves a small share of allowances to be auctioned if the price rises above a predetermined threshold and also sets a minimum price for allowances that are auctioned. One study finds that, for a given cumulative emissions reduction, a combined price ceiling and floor can reduce costs by almost 20 percent compared with a cap-and-trade program without any cost-containment mechanisms (Fell and Morgenstern 2009). On the other hand, it is possible that a floor or ceiling can cause total emissions to differ from the legislated cap.

**Offsets.** Offsets also can be an important cost-containment feature of a cap-and-trade program. Offsets are credits generated by reducing emissions in a sector outside the program; they can be purchased by a firm subject to the cap to meet its compliance obligations. Because greenhouse gases are global pollutants—they cause the same damage no matter where they are emitted—offsets offer the appealing prospect of achieving specified emissions reductions at a lower cost.

The purchase of offsets from the forestry and agricultural sectors could play a potentially important role in reducing the compliance costs of firms subject to the cap (Kinderman et al. 2008; Environmental Protection Agency 2009). And under some cap-and-trade programs, domestic firms may purchase international offsets to meet their compliance obligations. This possibility may encourage a foreign country to build a solar power plant rather than a coal plant so that it can sell the offsets in the U.S. market.

Despite these important advantages, however, it is crucial that the claimed reductions from offsets be real—otherwise the system will effectively provide payments without actually reducing emissions. Indeed, Europe’s experience with a project-based approach to international offsets suggests that concerns about the environmental integrity of claimed

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<sup>6</sup> Above \$7 per ton (in 2005 dollars), a firm can cover up to 5 percent of its emissions with domestic offsets, up from 3.3 percent. At \$10 per ton (in 2005 dollars plus a 2 percent increase per year), this amount increases to 10 percent of emissions and may include international offsets.

emissions reductions are well founded (Box 9-3).<sup>7</sup> If offsets are going to be included as part of a cap-and-trade program, substantial investments in rigorous monitoring methods, such as combining remote sensing with on-the-ground monitoring, to verify greenhouse gas reductions are crucial.

### **Box 9-3: The European Union’s Experience with Emissions Trading**

One of the pillars of the President’s proposed response to climate change is a cap-and-trade system to reduce U.S. emissions of greenhouse gases. The European Union’s Emission Trading Scheme (ETS), the world’s first mandatory cap-and-trade program for carbon dioxide emissions, was launched in 2005 to meet emission reduction targets agreed to under the Kyoto Protocol. The first phase of the ETS—from 2005 to 2007—applied to several high-emitting industrial sectors, including power generation, in 25 countries and covered just over 40 percent of all European Union (EU) emissions. Although data limitations and uncertainty over baseline emissions preclude researchers from assessing the precise magnitude of the reductions, one estimate suggests that the ETS reduced EU emissions by about 4 percent in 2005 and 2006 relative to what the level would have been in its absence. Because of the flexibility offered under the cap-and-trade program, these reductions occurred where it was cheapest to achieve them. That said, the ETS offers three important cautionary lessons as the United States explores how best to implement its own cap-and-trade system.

One lesson is the importance of carefully establishing a baseline for current and future emissions, so that the price sends an accurate signal to firms regarding how much to abate and innovate based on the expected future value of reductions. During the first phase of the ETS, EU countries allocated allowances based on firms’ estimates of their historic emissions. In April 2006, when monitoring data became available, the data showed that actual emissions were already below the cap. Allowance prices immediately fell from about €30 (\$38) per metric ton to less than €10 (\$13) before settling at €15–€20 (\$19–\$25) for the next few months.

The EU experience also demonstrates that distributing nearly all allowances to industry at no cost can lead to large windfall profits. The European Union distributed nearly 100 percent of allowances free to

*Continued on next page*

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<sup>7</sup> Cap-and-trade programs that allow project-level offsets are particularly susceptible to crediting activity that would have occurred anyway or that is replaced by high-carbon activities elsewhere (leakage). One way to reduce the potential for leakage is a sector- or country-based framework, in which sectors or governments receive credit in exchange for implementing policies to reduce emissions. The legislation passed by the U.S. House of Representatives includes a sector-based approach to international offsets.

*Box 9-3, continued*

firms subject to the cap in Phase 1 and only auctioned a small portion of allowances for Phase 2 (2008–12). One estimate (Point Carbon Advisory Services 2008) suggests that during Phase 2, electricity generators in Germany will reap the highest windfall profits of all participating EU countries, on the order of €14 billion to €34 billion (\$20 billion to \$49 billion). In countries with low-greenhouse-gas emitters, electricity generators are expected to benefit less. For instance, in Spain, windfall profits are estimated to be about €1 billion to €4 billion (\$1 billion to \$6 billion). In Phase 3 (2013–20), the European Union plans to auction the majority of allowances.

Finally, it is important to ensure that any offsets from domestic and international sources reflect real reductions. Otherwise, they may endanger the environmental integrity of the cap. The ETS allows limited use of project-based international offsets from the United Nations' Clean Development Mechanism (CDM) in place of domestic emission reductions. A review of a random sample of offset project proposals in the CDM program from 2004 to 2007 estimated that "additionality" was unlikely or questionable for roughly 40 percent of registered projects, representing 20 percent of emissions reductions, meaning they would have occurred anyway (Schneider 2007). Although the CDM has worked to improve its accounting procedures over time, the EU's experience demonstrates the importance of designing an offsets program carefully.

### ***Coverage of Gases and Industries***

Although carbon dioxide made up about 83 percent of U.S. greenhouse emissions in 2008, a cap-and-trade approach that gives firms flexibility in where they reduce emissions, both in terms of the greenhouse gas and the economic sector, can lower firms' compliance costs. One study found that achieving an emission goal by cutting both methane and carbon dioxide emissions rather than carbon dioxide alone could reduce firms' abatement costs in the United States by over 25 percent in the medium run (Hayhoe et al. 1999).

Costs are also affected by the number of industries covered by the cap, with the general principle being that greater coverage lowers the marginal cost of emissions reductions. A recent study comparing alternative ways to achieve a 5 percent reduction in emissions found that the cap-and-trade program's costs to the economy were twice as large when manufacturing was excluded as they were under an economy-wide approach (Pizer et al. 2006).

## *The American Clean Energy and Security Act*

In June 2009, the U.S. House of Representatives passed legislation—the American Clean Energy and Security Act (ACES)—that includes a cap-and-trade program consistent with the President’s goal of reducing greenhouse gas emissions by more than 80 percent by 2050, and the Senate is currently engaged in a bipartisan effort to develop a bill.

**Projected Climate Benefits.** Based on two analyses of the ACES legislation, U.S. actions would reduce cumulative greenhouse gas emissions by approximately 110 billion to 150 billion metric tons in CO<sub>2</sub>-equivalents by 2050 (Paltsev et al. 2009; Environmental Protection Agency 2009). The EPA estimates that emission reductions of this magnitude, when combined with comparable action by other countries consistent with reducing world emissions by 50 percent in 2050, is expected to limit warming in 2100 to less than 2 °C (3.6 °F) relative to the pre-industrial global average temperature, with a likely range of about 1.0 to 2.5 °C (1.8 to 4.5 °F).

To derive the possible benefits associated with the U.S. contribution to these emission reductions, the CEA calculates that the ACES will result in approximately \$1.6 trillion to \$2.0 trillion of avoided global damages in present value terms between 2012 and 2050 (in 2005 dollars).<sup>8</sup> The value of avoided damages includes such benefits as lower mortality rates, higher agricultural yields, money saved on adaptation measures, and the reduced likelihood of small-probability but high-impact catastrophic events. Further, the benefits will be significantly larger if U.S. policy induces other countries to undertake reductions in greenhouse gas emissions.

**Projected Economic Costs.** The estimated cost of meeting the caps outlined in the ACES legislation is relatively small. Recent research suggests that the ACES will result in a loss of consumption on the order of 1 to 2 percent in 2050 (Environmental Protection Agency 2009; Paltsev et al. 2009). On a per household basis, the average annual consumption loss would be between \$80 and \$400 a year between 2012 and 2050 (in 2005 dollars).

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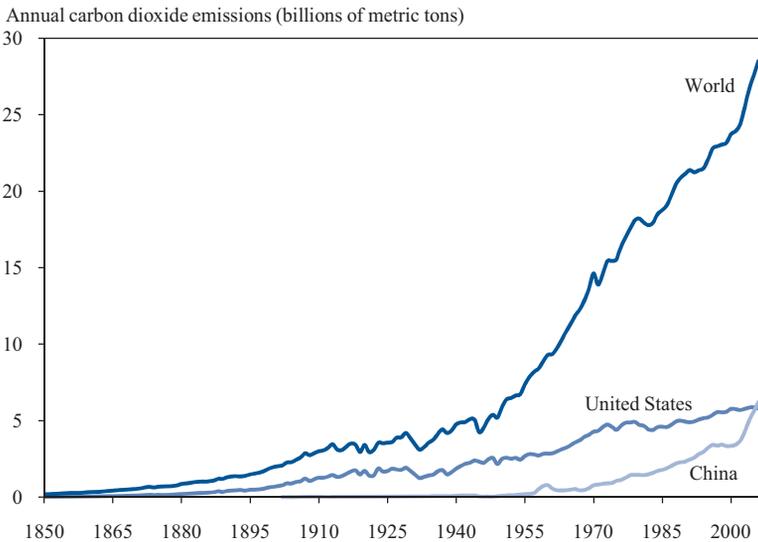
<sup>8</sup> The CEA uses estimates of the projected decline in emissions between 2012 and 2050 based on the President’s proposed reductions in emissions and uses the central estimate of \$20 a ton for a unit of carbon dioxide emitted in 2007 (in 2007 dollars) that was recently developed as an interim value for regulatory analyses (Department of Energy 2009c). Additionally, it assumes that the benefit of reducing one additional ton of carbon dioxide grows at 3 percent over time and that future damages from current emissions are discounted using an average of 5 percent. Several Federal agencies have used these values in recent proposed rulemakings but have requested comment prior to the final rulemaking, so these estimates may be revised.

## INTERNATIONAL ACTION ON CLIMATE CHANGE IS NEEDED

Greenhouse gas emissions impose global risks. As a result, just as U.S. efforts to reduce emissions benefit other countries, actions that other countries take to mitigate emissions benefit the United States. Given the global nature of the problem and the declining U.S. share of greenhouse gas emissions, U.S. actions alone to reduce those emissions are insufficient to mitigate the most serious risks from climate change.

Developing countries such as China and India are responsible for a growing proportion of emissions because of their heavy reliance on carbon-intensive fuels, such as coal (Figure 9-3). In 1992, China's carbon dioxide emissions from fossil fuel combustion were half those of the United States and represented 12 percent of global emissions. By 2008, China's carbon dioxide emissions represented 22 percent of global emissions from fossil fuels, exceeding the U.S. share of 19 percent and the European share of 15 percent. China's share of global emissions is projected to grow to about 29 percent by 2030 absent new emission mitigation policies. By contrast, the U.S. share of global emissions is projected to fall to about 15 percent by 2030 even absent new emission mitigation policy. Thus, cooperation by both

Figure 9-3  
United States, China, and World Carbon Dioxide Emissions



Notes: The figure includes carbon dioxide emissions from fossil fuel consumption, cement manufacturing, and natural gas flaring. Notably, this figure does not include changes in carbon dioxide emissions from land-use change.

Source: World Resources Institute, Climate Analysis Indicators Tool.

past and future contributors to emissions will be required to stabilize the atmospheric concentrations of greenhouse gases.

In keeping with this goal, the Administration has actively pursued partnerships with major developed and emerging economies to advance efforts to reduce greenhouse gas emissions and promote economic development that lowers emission intensity.

### ***Partnerships with Major Developed and Emerging Economies***

The President has worked to further a series of international agreements to address climate change. For example, he launched the Major Economies Forum on Energy and Climate to engage 17 developed and emerging economies in a dialogue on climate change. In July, the leaders of these countries agreed that greenhouse gas emissions should peak in developed and developing countries alike, and recognized the scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2 °C (3.6 °F). They also agreed to coordinate and dramatically increase investment in research, development, and deployment of low-carbon energy technologies with a goal of doubling such investment by 2015. Finally, the leaders agreed to mobilize financial resources in support of mitigation and adaptation activities, recognizing that the group should be responsive to developing-country needs in this area.

Also in July, leaders from the Group of Eight (G-8) countries agreed to undertake robust aggregate and individual medium-term emission reductions consistent with the objective of cutting global emissions by at least 50 percent by 2050. Additionally, under the Montreal Protocol, the United States jointly proposed with Canada and Mexico to phase down emissions of hydrofluorocarbons, a potent greenhouse gas used in refrigeration, fire suppression, and other industrial activities. This action alone would achieve about 10 percent of the greenhouse gas emission reductions needed to meet the agreed G-8 goal of a 50 percent reduction by 2050.

In December, the Administration worked with major emerging economies, including Brazil, China, India, and South Africa, developed countries, and other regions around the world to secure agreement on the Copenhagen Accord. For the first time, the international community established a long-term goal to limit warming of global average temperature to no more than 2 °C (3.6 °F). Also for the first time, all major economies agreed to take action to address climate change. Under the Accord, both developed and major emerging economies are in the process of submitting their emission mitigation commitments and actions to reduce greenhouse gas emissions. Every two years, developing countries will report on emission mitigation efforts, which will be subject to international consultation and

analysis under clearly defined guidelines. Establishing transparent review of developed and developing country mitigation activities will help ensure that countries stand behind their commitments.

Furthermore, under the Accord, in the context of meaningful mitigation actions and transparency, developed countries committed to a goal of jointly mobilizing \$100 billion a year in funding from a variety of private and public sources for developing countries by 2020. This funding will build on an immediate effort by developed countries to support forestry, adaptation, and emissions mitigation with funding approaching \$30 billion sometime in the 2010 to 2012 timeframe. There will be a special focus on directing this funding to the poorest and most vulnerable developing countries.

### *Phasing Out Fossil Fuel Subsidies*

The United States also spearheaded an agreement in September to phase out fossil fuel subsidies among G-20 countries, a goal seconded by countries in the Asian-Pacific Economic Cooperation (APEC) in November. The G-20 also called on all nations to phase out such subsidies worldwide. Fossil fuel subsidies are particularly large in non-OECD countries, such as India and Russia. Twenty of the largest non-OECD governments spent about \$300 billion on fossil fuel subsidies in 2007. Together, this coordinated action to reduce subsidies can free up resources, especially in developing countries, to target other social needs such as public health and education. One model estimates that eliminating fossil fuel subsidies in the major non-OECD countries alone would reduce greenhouse gas emissions by more than 7 billion metric tons of CO<sub>2</sub>-equivalent, enough to fulfill almost 15 percent of the agreed-upon G-8 goal of reducing global emissions by 50 percent by 2050 (Organisation for Economic Co-operation and Development 2009).

In the United States, these subsidies—including tax credits, deductions, expensing practices, and exemptions—are worth about \$44 billion in tax revenues between 2010 and 2019. Their elimination will help put cleaner fuels, such as those derived from renewable sources, on a more equal footing and reduce wasteful consumption of fossil-fuel based energy caused by underpricing. Proper pricing of fossil fuels will also help reduce reliance on petroleum, thus enhancing energy security and aiding in the achievement of climate mitigation goals.

## **CONCLUSION**

Today's economy is dependent on carbon-intensive fuels that are directly linked to an increase in global average temperature. Continued

reliance on these fuels will have a range of negative impacts, including increased mortality rates, reduced agricultural productivity in many locations, higher sea levels, and the need for costly adaptation efforts. For these reasons, a clean energy transformation is essential.

Through his comprehensive plan, the President has set the country on course to achieve this goal. He has taken several significant and concrete steps to transform the energy sector and address climate change through the American Reinvestment and Recovery Act and through targeted regulation. To address externalities associated with greenhouse gas emissions, the President has proposed a market-based cap-and-trade approach. These combined efforts will stimulate the research and development necessary to advance new clean energy technologies. Because of the global nature of the climate change problem, the Administration is also actively pursuing partnerships with other countries to advance efforts to transition the world to clean energy and reduce greenhouse gas emissions.



## C H A P T E R 1 0

# FOSTERING PRODUCTIVITY GROWTH THROUGH INNOVATION AND TRADE

Americans have always believed in building a better future. Each generation has strived to pass on higher standards of living to their children than they themselves experienced. And for most of American history, this goal has been realized. Per capita income has risen strongly for most of the past two centuries.

Such economic growth stems from a number of factors. Investment in skills and education, or human capital, is a key determinant. The United States has a long history of investing in people, and this has enabled American workers to be among the most productive in the world. Investment in physical capital is also important. The tremendous accumulation of machines, buildings, and infrastructure has been a source of America's prosperity, and times of particularly great investment, such as the 1950s and 1960s, have been times of particularly rapid advances in standards of living.

Because investing in people and capital is important to the maintenance and growth of standards of living, the President has fashioned an ambitious agenda of improvements in education, incentives for investment, and financial regulatory reform to ensure that we have the financial system needed to support such investment. These initiatives have been described in detail in earlier chapters.

But as important as investments in labor and capital have been and will continue to be, they are not the only sources of growth. A third, more amorphous factor has also played a central role in American economic growth: advances in the overall productivity of that labor and capital. One need only think of a few of the technological changes of the past century—the airplane, antibiotics, computers, fiber-optic cables, and the Internet—to see that technological discovery and innovation are central to improved standards of living. Such innovations not only make us richer as a country, they have the potential to fundamentally alter the very way we live our lives and interact with one another.

As discussed throughout this *Report*, in the past decade American economic growth has slowed in important ways. American families saw their median income actually fall from 2000 to 2006. An important part of restoring growth and increases in standards of living is spurring innovation and increases in productivity. American firms and universities will naturally play the leading role in this endeavor. But that does not mean government has no role to play. Indeed, overwhelming evidence shows that innovation creates positive “externalities”—benefits for others beyond the individuals or firms who originally produce new ideas. Since inventors do not reap the full rewards, on its own the market will produce less innovation than is optimal. Public policy therefore has a powerful role to play in fostering pursuit of the myriad possibilities for scientific, technical, and analytical advances.

At its best, trade between regions of the country and across borders can also be an engine of growth. Trade has the potential to allow the U.S. economy to expand output in areas where it is more productive and to enable higher-productivity firms to expand. Access to a world market encourages American firms to invest in the research needed to become technological leaders. Through these routes, a free and fair trade regime can play an important part in lifting living standards in the long run.

Based on an understanding that progress springs from achieving the proper balance between generous rewards for the creation of new ideas and encouraging the best of those ideas to spread widely, the Administration has formulated a comprehensive “innovation agenda” that reaches far beyond the traditional scope of science and technology policy. This agenda touches everything from improvements in the Patent and Trademark Office, to increased government investments in research and development (R&D), to engaging the world economy in ways that ensure that the United States achieves the maximum benefits from trade’s productivity-enhancing potential. This chapter discusses the key components of the agenda in detail.

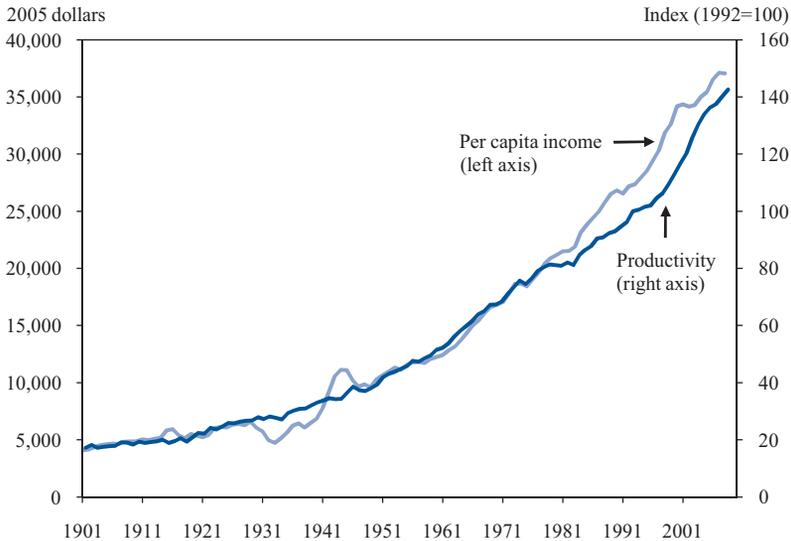
All advances in productivity, whether from scientific breakthroughs, changes in the organization of firms, or increased international trade, involve losers as well as winners. Because productivity growth is the critical source of improved standards of living, the most effective way to address the painful impacts for those harmed by progress is not to stifle new ideas or trade. Rather, it is to build a robust system of support that can help ease the transition from employment in declining firms and industries to jobs in new, higher-paying, higher-productivity areas. Even more important are broad-based policies that ensure that the gains from rising productivity are widely shared: progressive taxation, a health care system that provides security and stability, a strong educational system, and a secure social safety net.

For too many years, our Nation has ignored necessary reforms in these broad-based policies and underinvested in areas such as health care and education, which are essential to ensuring that middle-class families will benefit from productivity advances. That is why the Obama Administration has set as a central economic priority rebuilding our economy on a firmer foundation. The Administration’s innovation agenda must go hand in hand with progress in those areas as well.

## THE ROLE OF PRODUCTIVITY GROWTH IN DRIVING LIVING STANDARDS

In the long run, the critical determinant of living standards is labor productivity—the amount of goods and services produced by an average worker in a fixed period of time, such as an hour or a 40-hour week. Figure 10-1 provides striking visual confirmation of this hypothesis. It shows that over U.S. history since the early 20th century, sustained increases in labor productivity have translated nearly one-for-one into increases in income per person.

Figure 10-1  
Non-Farm Labor Productivity and Per Capita Income



Note: Productivity represents total output per unit of labor, 1901-1946, and non-farm business sector only, 1947-2008.  
Sources: Department of Commerce (1973); Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 7.1; Department of Labor (Bureau of Labor Statistics), Productivity and Costs Table A.

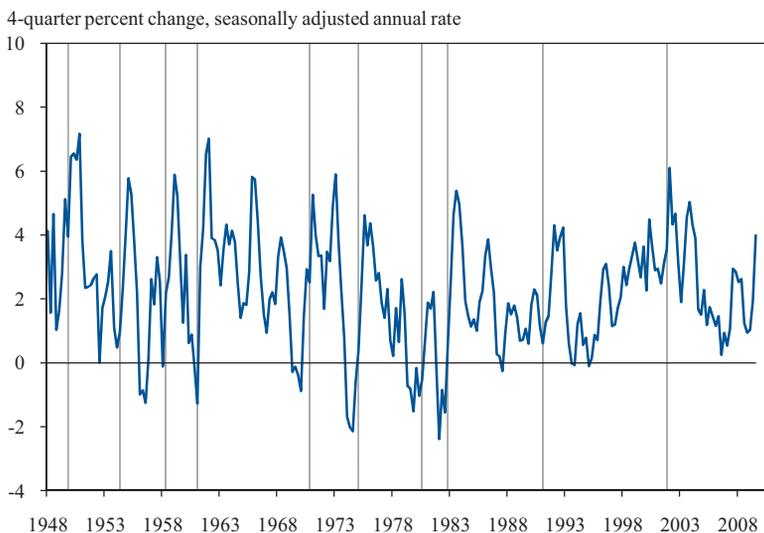
The importance of labor productivity to living standards may seem obvious, or even tautological, but it is not. In principle, increases in income per person could come not from more output per unit of labor input, but from more labor input per person—that is, from increases in the fraction of the population that is working or increases in each worker’s hours. But both the historical evidence from the United States and the evidence from across a wide range of countries show that differences in labor input per person account for at most a small fraction of income differences.

### *Recent Trends in Productivity in the United States*

Since labor productivity is the key driver of standards of living in the long run, it is important to discern the underlying trends in productivity. This task is complicated by the fact that in the short run, productivity depends on more than those underlying trends. It is powerfully influenced by the state of the business cycle, as well as by other factors (including simple measurement error) that leave no lasting mark on productivity.

Figure 10-2 shows the growth rate of labor productivity from four quarters earlier over the last 62 years. One immediate message is that although the overall pattern of productivity is strongly upward (as shown clearly by Figure 10-1), there is enormous short-run variation in productivity growth.

Figure 10-2  
Labor Productivity Growth since 1947



Note: Grey lines represent NBER business cycle troughs.

Source: Department of Labor (Bureau of Labor Statistics), Productivity and Costs Table A.

A more subtle message is that the average or trend rate of productivity growth is not constant but changes substantially over extended periods. It is conventional to divide the era from the beginning of the sample until about 1995 into two periods: the “immediate postwar” period from 1947 through 1972, and the “productivity growth slowdown” period from 1973 through 1995. In the immediate postwar period, the average rate of productivity growth was 2.8 percent per year. During the productivity growth slowdown, it was only 1.4 percent.

This division into different periods lets one see the cumulative importance of even seemingly modest changes in productivity growth. For example, if the high productivity growth of the immediate postwar period had continued through 1995 instead of slowing, the level of productivity in 1995—and hence standards of living—would have been more than one-third higher than they actually were.

The pattern of productivity growth since 1995 is somewhat complicated. From 1996:Q1 to the last available observation (2009:Q3), it averaged 2.7 percent per year, almost equal to its rate over the immediate postwar period. But that rapid growth was concentrated in the first part of the period. In the first eight years (1996:Q1 to 2003:Q4), productivity growth averaged 3.3 percent; in the four years before the business cycle peak (2004:Q1 to 2007:Q4), it averaged only 1.7 percent. A four-year period is too short to confidently determine underlying trends. But productivity growth in the years leading up to the recession was not strong enough to generate robust increases in standards of living.

A final pattern revealed by Figure 10-2 is a relationship between productivity growth and the business cycle. Productivity growth tends to fall during recessions and surge near their ends (marked by the vertical lines in Figure 10-2). This pattern has been operating strongly in the current recession. Productivity growth averaged less than 1 percent at an annual rate over the first five quarters of the recession, but then surged in 2009:Q2 and 2009:Q3, and appears to have remained high in 2009:Q4.

This recent experience highlights the importance of distinguishing between cyclical movements in productivity and longer-term movements: the pattern in productivity growth in 2009 largely reflects the fact that employment moves more slowly than production over the business cycle. The sluggishness of employment growth has meant that even as output reached its low point and began to recover, employment continued to decline. This cyclical improvement in productivity is obviously of a different character than the secular improvements that are the source of long-run increases in standards of living. Over the course of 2009, standards of living clearly did not follow productivity closely. But once the cyclical dynamics

play themselves out, the usual long-term role of productivity growth in driving income growth is bound to reassert itself. An important goal of policy is to make the long-term path of productivity as favorable as possible.

### *Sources of Productivity Growth*

Productivity growth is the overwhelming determinant of the progress of economic well-being over extended periods. It is therefore imperative to understand what determines productivity growth. Three sources have been identified as key.

The first source is the accumulation of physical capital—the machines, tools, computers, factories, infrastructure, and so on that workers use to produce output. Each year, some of our Nation’s economic output takes the form of these capital goods. When workers have more or better capital to work with, they are more productive.

The second source is the accumulation of human capital—workers’ education, skills, and training. The accumulation of human capital is just as much an investment as the accumulation of physical capital is. When some of the economy’s output takes the form of physical capital goods rather than consumption, we are forgoing some consumption today in exchange for the ability to produce more in the future. Likewise, when students and teachers are in a classroom, or when an experienced worker is taking time to train a new hire, resources that could be used to produce goods for current consumption are being used instead for activities that increase future productive capacity. And just as a worker with better equipment is more productive, so too is a worker with more skills.

The third source of productivity growth is increases in the amount that can be produced from given amounts of physical and human capital. This factor goes by various names, such as “total factor productivity growth” or “the Solow residual.” It encompasses all the forces that cause changes in how much an economy produces from its stocks of physical and human capital. Most obviously, it encompasses advances in knowledge and technology. These advances in knowledge and technology allow factory workers to build better automobiles and electronics from the same raw materials; they allow doctors to provide more accurate diagnoses and prescribe better treatments in the same office visit; and much more.

But total factor productivity growth includes more than advances in knowledge and technology. For example, if an economy faces an increase in crime, individuals may devote more of their skills and physical capital to protecting the goods they have rather than producing more goods, and so total factor productivity growth may be low or even negative. If a country switches from central planning to a market-based economy, then

workers and capital are likely to be allocated more effectively, and so output given the economy's stocks of physical and human capital may increase greatly. Changes in these types of "organizational capital" (or "institutional" or "social" capital) are potentially critical determinants of total factor productivity growth.

Research has not just identified changes in these three factors (physical capital, human capital, and total factor productivity) as critical determinants of productivity growth; it has also come to a fairly clear view about their relative importance. Perhaps surprisingly, the ranking of the three factors appears to be the same whether one is trying to understand the enormous growth in productivity over extended periods in the United States (for example, Jones 2002), or the vast differences in the level of productivity across countries (for example, Hall and Jones 1999).<sup>1</sup>

The factor that is most obvious and easiest to quantify—physical capital accumulation—turns out to be only moderately important. Differences in the fraction of output devoted to physical capital investment account for some portion of both long-run productivity growth and cross-country productivity differences, and increases in investment can have a significant impact on productivity growth, and hence on standards of living. At the same time, the evidence suggests that the other factors are even more important.<sup>2</sup>

One of those more important factors is human capital accumulation. Increases in the education and skills of the workforce play a substantial role in the long-term growth of labor productivity, and cross-country differences in human capital per worker are important to cross-country differences in labor productivity. Thus, increases in human capital investment through a stronger educational system and greater educational attainment at all levels, together with lifetime learning, provide another powerful route to raising productivity growth and standards of living.

The most important determinant is not physical or human capital accumulation, but changes in how much can be produced with them—that is, total factor productivity growth. Again, this finding applies to both long-term growth and cross-country differences. At an intuitive level, this result is not surprising. It seems very plausible that the most important reason we are so much more productive than our forebears is that, for reasons ranging

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<sup>1</sup> See also Klenow and Rodríguez-Clare 1997; Hendricks 2002; Caselli 2005; and Hsieh and Klenow 2007.

<sup>2</sup> There is a subtlety here. When total factor productivity or human capital improves, the result is higher output, which then leads to more physical capital investment if the fraction of the economy's output that is invested does not change. The decompositions that find a moderate role for physical capital assign these indirect effects of total factor productivity and human capital investment to those factors, and not to physical capital. If those effects are instead assigned to physical capital, its importance increases greatly.

from advances in basic scientific knowledge to improved ways of organizing the workplace, we have found vastly better ways of producing output from a given set of inputs. Likewise, it is likely that a key reason the United States outperformed the Soviet Union economically in the postwar period was not that the United States was better at channeling its productive capacity into producing capital goods and its children into education (both of which the Soviet Union did on a very large scale), but that the United States' free-market institutions led it to produce more from its inputs, and led to myriad innovations that widened the productivity gap over time.

This discussion implies that in order to foster improvements in standards of living, policy should foster investment in physical capital, investment in human capital, and crucially, improvements in total factor productivity. Physical and human capital investment are discussed in earlier chapters—most notably Chapter 4 (as well as Chapters 5 and 6) in the case of physical capital investment, and Chapter 8 in the case of human capital. The remainder of this chapter turns to measures to improve total factor productivity. Such improvements in total factor productivity can be described broadly as “innovations.”

## **FOSTERING PRODUCTIVITY GROWTH THROUGH INNOVATION**

Because total factor productivity reflects all determinants of labor productivity other than physical and human capital, it has a wide range of elements. As a result, there are many avenues along which well-designed policies can work to improve total factor productivity. It is for this reason that the Administration has proposed a comprehensive innovation agenda (Box 10-1).

### **Box 10-1: Overview of the Administration's Innovation Agenda**

On a September 21 visit to New York's Hudson Valley Community College, President Obama presented the first comprehensive description of the Administration's Innovation Agenda, the conceptual framework underpinning the wide range of initiatives that the Administration has undertaken that share a common aim of fostering innovation.

The Agenda has three elements. The first is a commitment to invest in the building blocks of innovation, including basic scientific research and infrastructure, as articulated in detail in the body of this chapter.

*Continued on next page*

*Box 10-1, continued*

The second is a recognition of the vital role that competitive markets and a healthy environment for entrepreneurial risk-taking play in spurring innovation; reform of the Patent Office, improving the accessibility and usefulness of government statistics, and increasing the predictability and transparency of government policy are all parts of this effort. The final part of the agenda is a particular focus on innovation targeted toward specific national priorities, including the development of alternative energy sources, reducing costs and improving medical care through the use of health information technology, the creation of a “smart grid” that will allow more efficient use of existing energy generation capacity, and initiatives aimed at inventing cleaner and more fuel-efficient transportation technologies.

The Agenda builds on over \$100 billion of funds appropriated in the American Recovery and Reinvestment Act of 2009 for the support of innovation, education, and technological and scientific infrastructure. It also encompasses directives to regulatory and executive branch agencies designed to help them refocus their missions to support the Agenda in whatever ways are most appropriate to their usual activities. A final key tool is the commitment to science-based, data-driven policymaking that brings to bear all the intellectual, statistical, informational, and analytical resources necessary to make sure that government policies achieve their stated aims as efficiently and effectively as possible.

### ***The Importance of Basic Research***

One uncontroversial conclusion of work on the determinants of productivity growth is that the payoff to investment in basic scientific and technological research has been vast, at least in some fields and over the long run. Breakthroughs on fundamental questions of physics, chemistry, biology, and other sciences have powered the transformations of economic production that underlie much of the productivity growth measured (however imperfectly) in economic statistics (Nordhaus 1997; Nelson and Romer 1996).

The Administration has taken that lesson to heart in its support for basic research in science and technology, especially in two areas where the need for progress is pressing: energy and biomedical research. The Department of Energy has created a new Advanced Research Projects Agency-Energy (ARPA-E), with the objective of pursuing breakthroughs

that could fundamentally change the way we use and produce energy. In the medical and biological sciences, the Administration has ended restrictions on Federal funding for embryonic stem cell research, and in September 2009 it announced \$5 billion in grants under the American Recovery and Reinvestment Act to fund cutting-edge medical research.

Across all areas, the Recovery Act included \$18.3 billion for research funding. Because the Administration's commitment to evidence-based policymaking will require substantial improvements in the ability to reliably measure economic outcomes, the Act committed \$1 billion to the 2010 Census as a first step in a longer-term effort to revamp the Nation's statistical infrastructure—a process that will not only improve policymaking but will also help private businesses make better decisions (for example, about where to locate new production or sales facilities).

In addition, the fiscal year 2011 budget enhances research funding in numerous ways. First, it continues to work to fulfill the President's pledge to double the budgets of three key science agencies (the National Science Foundation, the Department of Energy's Office of Science, and the Department of Commerce's National Institute of Standards and Technology). Second, it boosts funding for biomedical research at the National Institutes of Health by \$1 billion to \$32.1 billion. Third, it reinvigorates climate change research through increased investments in earth observations and climate science in agencies such as the U.S. Geological Survey and the National Oceanic and Atmospheric Administration. Fourth, it funds potentially groundbreaking discoveries with a boost to Department of Defense basic research and \$300 million for the Department of Energy's ARPA-E program. Finally, it supports world-class agricultural research for national needs such as food safety and bioenergy with \$429 million for the competitive research grants program in the Department of Agriculture's new National Institute of Food and Agriculture.

As part of the innovation agenda, and to ensure that the increased research funds are spent well, the Administration has also instructed agencies to work on constructing a set of systematic tools to track the long-term results of federally sponsored research, such as journal articles published and cited, patents obtained, medical advances achieved, or other measurable consequences (particularly in areas of national importance such as health or energy). Although the fruits of this effort will not be available for a number of years, the project is one of the most promising in the Administration's efforts at turning the evaluation of scientific research into a "science of science."

## *Private Research and Experimentation*

Scientific breakthroughs are only the first step in producing improvements in total factor productivity and hence living standards. Benjamin Franklin's discovery that lightning was a form of electricity did not produce an immediate reduction in damage from electrical storms; much further research and development was necessary to turn that discovery into the lightning rod (though by late in his life Franklin was able to observe a flourishing industry that had been built upon his insight).

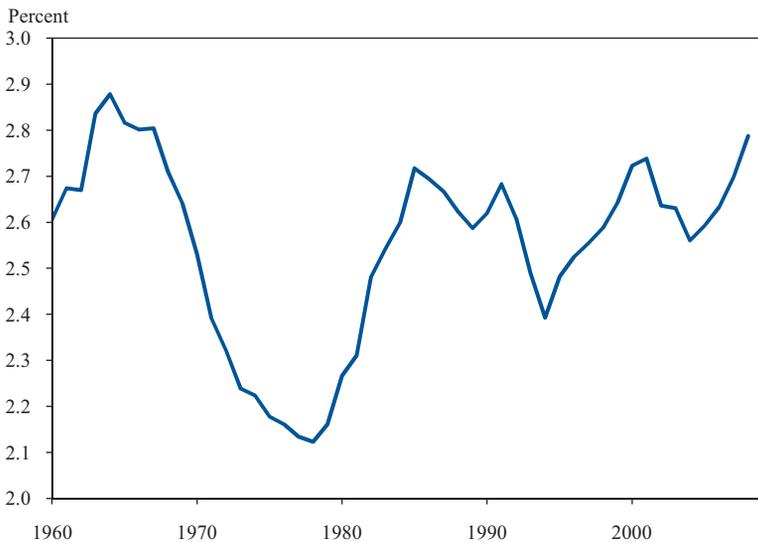
Measuring the returns to the economy as a whole from private research and experimentation is almost as formidable a challenge as measuring the returns to basic research. But most studies find that aggregate returns to such spending are much higher than the returns to ordinary investments in physical capital. Some work estimates the aggregate returns at 50 percent or higher (Hall, Mairesse, and Mohnen 2009).

These returns are mostly not received by the firms or individuals who pay for the work, because the ideas ultimately benefit others in many ways whose value is not captured through markets. Economic theory provides a clear prescription for policy toward activities that have measurable positive externalities: the activities should be subsidized.

This is the logic behind the research and experimentation (R&E) tax credit that has been an off-and-on part of the tax code for many years. But the credit's effectiveness has been hampered by chronic uncertainty about how long it will remain in force. Partly for budgetary accounting reasons, the R&E tax credit has been treated for many years as a temporary provision that was scheduled to expire at some point in the near future. Yet each year (except for 1995), Congress and the President have agreed (sometimes at the last minute) to extend the credit. The effect has been to substantially increase the uncertainty that firms face about the costs that they will end up paying for their research and experimentation projects; this uncertainty can have a serious negative effect on research, which is already a highly uncertain investment. The problem is particularly acute for the kinds of projects that might be expected to have the highest returns: long-term projects that require continuing expenditures over many years. For such projects, uncertainty about whether the R&E tax credit will be in place through the duration of the project can make the difference between pursuing or abandoning the research. The Administration therefore supports efforts in Congress to make the R&E tax credit permanent, so that the highest-return long-run projects can be confidently started without uncertainty about whether the credit will be there for the duration.

The importance of both public and private R&D spending for innovation and improvements in standards of living forms the basis for a key Administration goal. In a speech in May 2009 to the National Academy of Sciences, the President articulated the ambition of boosting total national investment in research and development to 3 percent of gross domestic product. As can be seen from Figure 10-3, this is a rate that would exceed even the peak rates reached in the 1960s. As described earlier, the American Recovery and Reinvestment Act began the Federal contribution with a historic increase in direct funding for scientific and technological research, as well as major investments in technological and scientific infrastructure detailed below. But reaching the President’s goal will require not just an increase in the Federal Government’s role; equally important is the need for a resurgence of entrepreneurial and corporate investment in research. The Administration’s consequent focus on creating the best possible environment for private sector innovation is one of the many novel aspects of its innovation agenda.

Figure 10-3  
R&D Spending as a Percent of GDP



Note: Data for 2008 are preliminary.  
Sources: National Science Foundation, Science and Engineering Indicators 2010 Tables 4-1 and 4-7.

### ***Protection of Intellectual Property Rights***

A subsidy like the R&E credit is one way to address underinvestment caused by the fact that the inventor of a new technology does not reap all the benefits of that invention. An older approach is embodied in the American

system of patents and copyrights that had its origins in the Constitution (and before that, in the English legal system).

One leading scholar (Jones 2001) has argued that the invention of ways to protect intellectual property may have been a trigger for the industrial revolution that led to the modern era of economic growth. In this interpretation of history, the creation of a legal system that could protect intellectual property may have been one of the most important “technological” developments in human history. Though this interpretation can be debated, the practical implication is surely correct: achieving the proper balance between the private and the societal rewards from innovation is a critical element in creating and sustaining long-run economic growth.

The existing U.S. patent system developed over many years in response to the needs of an industrial economy. That system has been under considerable strain in the past couple of decades as the United States and the world have moved increasingly toward a “knowledge-based” economy. The Patent and Trademark Office (PTO) has been required to answer many questions that could not have been imagined in 1952 when the current patent statute was written, such as how and whether to grant patents for human genes or for Internet advertising tools. Further, the sheer volume of information necessary to evaluate a patent application, which might now arrive from any country in the world and might rely on ideas that even an expert might be unfamiliar with, has made the PTO’s job increasingly daunting. As a result of these challenges, the agency currently faces a backlog of over 700,000 unexamined applications. Waiting times on a patent application can extend to four years or more. The costs that such waiting times impose on firms are substantial; and delays impose a particularly large burden on startup firms that rely on patents to attract venture capital funding—precisely the kind of firms that the Administration’s innovation agenda is particularly designed to help.

While the PTO has made progress in responding to these problems, most notably by developing a “peer review” system modeled on academic publishing, observers agree that the patent system is in need of an overhaul. The Administration has endorsed the aims of bills pending in Congress that would address many of these problems, particularly by giving the PTO authority to set fees that cover the cost of application processing, and also by barring diversion of fees to projects unrelated to PTO activities. The PTO is also in the process of creating an Office of the Chief Economist, which will provide a mechanism for better integration into patent policy of economic research on how to properly reward innovation without stifling the widespread use of good ideas.

In recognition of the role of innovation and intellectual property in advancing continued U.S. leadership in the global economy, in 2008

Congress created the Office of the United States Intellectual Property Enforcement Coordinator. This office is charged with creating and implementing a strategy to coordinate and enhance enforcement of intellectual property rights in the United States and overseas. By ensuring that the Administration has a coordinated strategy, this office will work to ensure that the effort of American workers and businesses to produce creative and innovative products and services is valued fairly around the world.

### ***Spurring Progress in National Priority Areas***

Much of the Administration's innovation agenda is aimed at creating a general economic environment that encourages innovation across the board. But the Administration has also focused special attention on certain areas where particular national needs are urgent. These include investments in building a "smart grid" to enhance the reliability, flexibility, and efficiency of the electricity transmission grid; research on renewable energy technologies like wind, solar, and biofuels; and support for research into advanced vehicle technologies. These investments are motivated not only by the perception that technological breakthroughs are possible and would be highly valuable, but also by the enormous potential benefits that such breakthroughs could have in terms of enhancing national security, mitigating pollution, and stemming climate change. These are also investments that have a direct impact on creating high-paying, durable jobs—something that is particularly valuable at a time of high unemployment. Thus, as noted in Chapter 9, investments in the clean energy transformation involve two layers of externalities: innovators fail to receive the full economic benefits of their breakthroughs as measured by market valuation, and the market valuation itself understates the true social benefits of the breakthroughs.

Another priority, given the looming threat that health care spending poses to the Federal budget, is developing technologies for measuring and monitoring health more efficiently. Through the Recovery Act, the Administration has allocated substantial funds to development of a 21st-century system of medical recordkeeping that should jump-start work in this area.

### ***Increasing Openness and Transparency***

To noneconomists, the idea that the legal system or the Patent Office is a form of technology seems a bit of a stretch. Even more challenging is the idea that a society's overall degree of openness and transparency may be a key determinant of economic progress. Yet a substantial body of economic research has found that measures of openness and transparency

in governmental policymaking processes have a strong association with growth outcomes.

There are several reasons why this may be so. One fairly simple one is that openness and transparency make it more difficult for special interests to achieve their aims at the expense of the public. Another view, which is not in conflict with the first, is that the process of requiring policies to be explained and encouraging wide discussion about them yields new ideas and improvements of existing ideas that might not otherwise have occurred even to the cleverest and most well-motivated public servant.

A more speculative proposition is that a commitment to openness and transparency on the part of the government is a form of investment in the kind of “organizational capital” described earlier. Economic research has found a strong correlation between measures of governmental transparency or openness and private sector productivity. Interpretations of this relationship are a matter of debate; some scholars argue that higher levels of productivity and income cause citizens to demand better government; others argue that both governmental openness and private productivity are a reflection of deeper unmeasured forces; and some advocate the straightforward view that open and transparent government has a direct effect in producing greater private sector efficiency.

The Administration’s commitment in this area has been on full display in the unprecedented openness and transparency surrounding implementation of the Recovery Act. The most obvious manifestation of this transparency is the creation of the independent Recovery Accountability and Transparency Board charged with monitoring and reporting on the government spending under the Act. Likewise, the requirement that recipients report on job creation and retention each quarter provides a new source of information on the employment impact of the Act. The knowledge generated by the data collection and measurement under the Recovery Act will be valuable in assessing economic policymaking for years to come.

The principles of openness, accountability, and public input are far broader than just the Recovery Act, however. The Administration’s “open government” initiative aims to harness the power of the Internet to bring the same commitment to transparency and accountability to every part of the Federal Government. New tools for this purpose are being developed not only by government agencies but by the private sector, by open source software programmers, and by citizens around the country. It seems plausible that eventually the new kinds of openness and transparency made possible by new forms of technology will have the same kinds of positive effects on growth that openness and transparency seem to have had across countries in the past.

## TRADE AS AN ENGINE OF PRODUCTIVITY GROWTH AND HIGHER LIVING STANDARDS

Specialization has long been understood to be an important source of productivity growth. In his *Wealth of Nations*, Adam Smith (1776) extolled the virtues of specialization in the pin factory where many different specialized laborers were involved in producing a simple pin. Perhaps the most important form of specialization is a transition from a subsistence society, where people produce all their consumption goods themselves, to a market economy, where people focus on particular skills and occupations and depend on purchases for their daily needs. Another significant transition, though, is one from a country that must produce everything its inhabitants want to consume toward one that specializes in particular goods and services and sells them on global markets for other goods and services.

Increases in trade and increases in GDP tend to go hand in hand, but untangling whether economic growth is generating more trade or whether trade is lifting growth is a difficult task. Creative research, however, has been able to demonstrate the causal role trade plays in increasing the amount a society can produce. One study demonstrated that countries that were geographically better suited for trade (because of their proximity to trading partners, access to ports, and the like) have higher levels of GDP (Frankel and Romer 1999). Another demonstrated that the same relationship can be seen across time (Feyrer 2009).<sup>3</sup>

Initially, trade was about introducing products (such as spices) from one market to another, providing consumers with choices they previously did not have. Still today, trade can offer consumers different goods and different varieties of products already available to them and bring new technology from other countries. By allowing countries to specialize based on skills or endowments, trade can also allow countries to improve their standards of living. Trade can also help a country increase its overall output by allowing firms or industries to take advantage of economies of scale or by encouraging the growth of more productive firms. Thus, trade has the potential to increase the overall quantity of goods and services that a given economy can produce with its resources—and hence increase the overall standard of living—making global commerce a cooperative, not a competitive venture. A clear rules-based system with enforcement of those rules can help ensure that trade is mutually beneficial.

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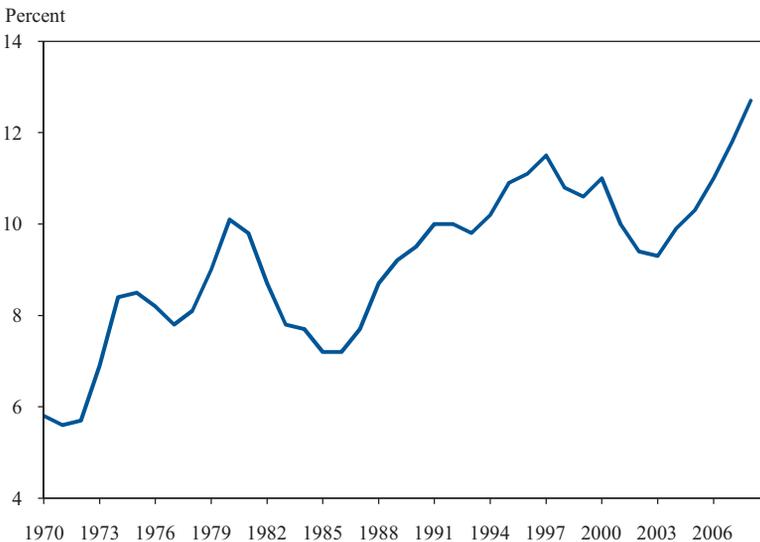
<sup>3</sup> The transition from sea to air traffic for much of the world's trade has meant more of a collapsing of distance for some nations than others. Because some sea-based trading routes are inconvenient, a shift to air transport has increased trade more for some nations than others. Controlling for other features, countries whose trade has increased due to this transition have grown faster than other countries.

While the act of specializing should lift living standards over time, it requires shifting resources from one sector to another, and so can generate short-run dislocations. As a result, it is essential to strengthen both targeted and more general policies that seek to ensure all can benefit from increases in trade. For this reason, after this section describes the productivity-enhancing benefits trade can generate for the U.S. economy, the following section discusses how progressive taxation and a strong social safety net are crucial counterparts to productivity change of all types.

### *The United States and International Trade*

Because of its massive size, the United States can engage in a considerable amount of specialization and trade within its own economy. Historically, foreign trade as a share of GDP has been smaller in the United States than in most other countries. In 1970, exports as a share of GDP for the average member of the Organisation for Economic Co-operation and Development (OECD) was 25 percent, while in the United States, the share was just 6 percent. By 2008, exports had increased to 13 percent of the U.S. economy (see Figure 10-4). Although that share is still relatively small, the increase in trade over the past four decades has meant that even in a large country like the United States, global commerce is an important part of the economy and—as discussed below—can be an important source of productivity growth.

Figure 10-4  
Exports as a Share of GDP



Source: Department of Commerce (Bureau of Economic Analysis), National Income and Product Accounts Table 1.1.10.

Millions of American workers contribute to the production of goods and services that are exported to foreign markets, and their jobs, on average, pay higher wages than a typical job. The Commerce Department estimates that in 2008 U.S. exports represented the work of roughly 10 million American workers. The majority of these export-supported jobs were related to the export of goods; millions more were related to services exports and nearly a million were related to agricultural exports. The manufacturing sector is particularly connected to exports; 20 to 30 percent of manufacturing employment in the United States in 2008 was supported by exports. These estimates represent the number of job-equivalents based on total hours needed to produce the volume of exports. Because few workers produce exclusively exports or inputs for exports, the number of workers who are involved with exports is likely much larger than 10 million.

Currently, the U.S. economy is far from full employment, and any increased production could generate an increase in jobs. Chapter 4 discusses how an increase in exports may be an important part of GDP growth in the medium term. In the long run, though, the principal contribution of an increase in the trade share will be the increase in productivity and living standards it can generate. Thus, the rise in the export share of the economy from 6 percent in 1970 to 13 percent today represents specialization, as some workers who produced goods for domestic use have moved into export sectors. The following sections describe the ways in which trade can increase productivity.

### ***Sources of Productivity Growth from International Trade***

Productivity growth can come from a number of channels. Trade can allow increased specialization; it can allow increased scale of production; and it can allow more productive firms to grow rapidly, increasing their share of the economy.

***Specialization.*** In the United States, a primary source of trade-related productivity growth is specialization. The concept of Ricardian comparative advantage—that nations specialize in producing the goods that they can produce cheaply relative to other goods—can be seen in a number of aspects of U.S. trade. America makes far more aircraft, grain, plastics, and equipment (optical, photographic, and medical) than it consumes. In these product areas, the United States has a substantial trade surplus, totaling over \$100 billion in 2008. Conversely, the United States produces less electrical equipment, clothing, furniture, and toys than it consumes, and therefore imports more of these goods than it exports. If America cut its production of aircraft, where it has a comparative advantage, by the \$50 billion it

currently exports on net and instead tried to produce more of the goods we currently import, productivity would likely be lower.

Specialization also takes place within industries. For example, within the broad category of “electrical machinery and equipment,” America imports telephones (including cell phones) and computer monitors, but exports electronic integrated circuits. Specialization can even take place within more narrow product classifications (for example, computer memory). Advanced countries with higher wages tend to produce and export more high-quality products even as they import lower-cost, lower-quality products from abroad in the same product type. Economists refer to this within-product differentiation as the “quality ladder,” and extensive research in recent years has noted this pattern of specialization within products (Schott 2004). Over time, high-skill countries climb the quality ladder, making higher-quality products and increasingly importing low-skill products.

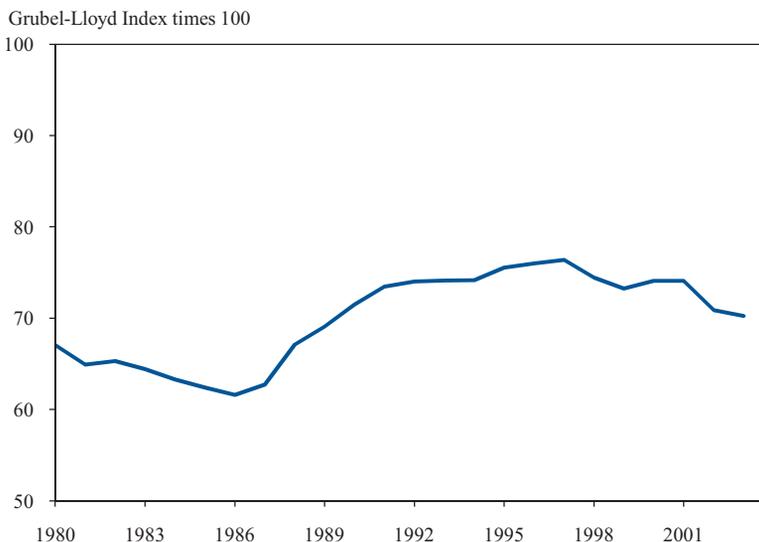
For example, consider the category “electrically erasable programmable read-only memory.” The United States both imports and exports billions of dollars worth of products in this category every year, but the average unit price of the exports is roughly three times the average unit price of the imports. The U.S. products may have bigger memories with more complex production processes or be of higher quality than the cheaper imports. In any event, the imports and exports do not appear to be overlapping. Again, such a division of labor allows for higher standards of living across the world.

***Intra-Industry Trade.*** Beyond specialization, trade can generate productivity advances in a number of ways. One important channel is that trade can allow companies to achieve a scale of production that they could not attain by selling just to the local market, thus increasing their productivity. Within any given economy, there is a limit to the quantity of a specific good that the domestic market will want to consume. The ability to manufacture more of a product than domestic consumption supports and exchange it for other products—even ones that are extremely similar to the exported good—can be quite beneficial. It results in economies of scale that can be internal to a firm, where one company grows quite large and productive at making one good, or to a region, where a particular good tends to be made in a given physical location as a substantial amount of expertise builds up there.

Trade in which different quality or simply different brand products are traded in both directions, known as intra-industry trade, represents between 40 and 50 percent of trade in the world economy. For the manufacturing industry of the United States, that figure is even higher. As Figure 10-5 shows, intra-industry foreign trade moved from roughly 65 percent of U.S.

manufacturing trade in the 1980s to roughly 75 percent in 2001. Frequently, this means two very similar countries engaging in trade with each other. Five of the seven largest U.S. trading partners are advanced economies; in fact, despite some observers' focus on low-wage country imports, roughly 50 percent of U.S. imports come from other advanced economies. These countries often have similar endowments of labor and are generally able to use the same technology, but narrow specialization within product classes, different brands, or differences in resource allocations allows for productive exchange.

Figure 10-5  
Intra-Industry Trade, U.S. Manufacturing



Source: Organisation for Economic Co-operation and Development, Structural Analysis (STAN) database.

**Firm Productivity.** Trade can also allow productive firms to grow relative to less productive firms as they increase their scale. A new literature on “heterogeneous firms” has focused less on differences in endowments or comparative advantage across countries and more on how firms within an economy respond to trade. A crucial insight in this literature is that most firms do not engage in trade, but those that do are on average more productive and pay higher wages. This literature shows that when a country opens to trade, more productive firms grow relative to less productive firms, thus shifting labor and other resources to the better organized firms and increasing overall productivity. Even if workers do not switch industries, they move from firms that are either poorly managed or that

use less advanced technology and production processes toward the more productive firms. Thus, firm-level evidence demonstrates that trade allows not only economy-wide advances through resource allocation, but also allows within-industry productivity advances through reallocation of resources across firms. This shift has clear welfare-enhancing impacts; see Bernard et al. (2007) for a general overview of this literature.

**Vertical Specialization.** Thus far, the discussion regarding sources of productivity growth in international trade has assumed that finished goods are being bought and sold across borders. The world of trade, though, has changed substantially. Today, multinational corporations (U.S. or foreign-based) are involved in 64 percent of U.S. goods trade (imports and exports), and fully 19 percent of U.S. goods exports are sales from a U.S. multinational firm to its affiliates abroad. An increase in international vertical specialization, where firms have production in multiple countries and break up the production of a particular good into stages across different countries, has contributed significantly to growth in world trade. The process can be within a large firm or intermediate inputs can be bought and sold on the market. Decreased trade costs have made it easier to break up the value chain of production as various parts of production can be done in different places and an in-process good can be shipped many times before final assembly. One study estimates that roughly one-third of the growth in world trade from 1970 to 1990 was attributable to the growth in vertical-specialization exports (Hummels, Ishii, and Yi 2001). Calculations about the extent of vertical specialization vary from estimates that 30 percent of OECD exports contain imported inputs to estimates that intermediate inputs account for up to 60 percent of world trade.<sup>4</sup>

A trade system in which the same firms are both importers and exporters complicates considerations of the impacts of trade on different groups, as comparative advantage may not matter as much for a particular good as for a particular task or piece of the production process. Specialization by process should allow the United States to focus on jobs oriented toward the processes that match the human capital, physical capital, and technology in the United States, again increasing productivity. But it has also raised fears that the process of adjustment could be disruptive, as a broader range of jobs could be exposed to international competition. The crucial policy goal is to harness the benefits of trade and ensure that its benefits are shared broadly by all Americans.

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<sup>4</sup> The 30 percent figure refers specifically to the share of exports that is made from imported inputs—sometimes called the vertical specialization of exports. The larger figure includes the volume of trade that is imports of intermediate goods used in the production of goods for either exports or the home market.

## *Encouraging Trade and Enforcing Trade Agreements*

All of these aspects of trade highlight its potential to contribute to the long-run expansion of productivity in the United States. Many of the advantages of increased trade come from opening foreign markets to the products of U.S. workers. The best way to guarantee reliable access is through negotiated trade agreements and consistent enforcement of existing trade rules. As noted in Chapter 3, one positive development in the recent crisis is that, for the most part, countries did not resort to protectionism; that is, they did not close their markets to imports. Had they done so, the dislocation in U.S. employment would likely have been much worse. As it was, U.S. imports of goods and services fell 34 percent and exports dropped 26 percent from July 2008 to April 2009. From their peak in the third quarter of 2008 until the trough in the second quarter of 2009, the nominal value of exports of goods and services fell more than \$400 billion at an annual rate, a drop of almost 3 percent of GDP. Imports also dropped substantially. In the long run, such a decline in world trade would be harmful for the U.S. economy. If trade had stayed at that depressed level, with lower trade surpluses in the United States' main export goods and smaller trade deficits in our import goods, the long-run dislocations from the crisis would have been worse than now expected. But U.S. exports are rebounding, opening the possibility that many workers who lost jobs in the crisis may find employment in the same productive industries where they were before the crisis.

Several explanations have been offered for this avoidance of protectionism during the crisis. One is the availability of macroeconomic policy tools such as fiscal and monetary policy (Eichengreen and Irwin 2009); another is the public commitments made by leaders at the Group of Twenty summits to avoid protectionist strategies. But the clear and concrete rules-based trade system was helpful as well. That rules-based system, embodied by the World Trade Organization (WTO) and by other trade commitments, allows the United States to take steps to ensure that other countries will abide by their obligations. It is also designed to give U.S. workers and firms confidence about the economic environment they will be facing and confidence that commitments made when trade agreements are negotiated will be kept. In addition, creating predictable and enforceable markets for innovative and creative works grounded in intellectual property rights is essential to spurring and protecting U.S. investments in technology and innovation.

The Administration recognizes that simply negotiating trade frameworks is not enough; robust enforcement of trade rules is an important part of our engagement in the world economy. The Administration has taken many trade enforcement actions recently. For example, the

Administration has continued pressing a WTO case that challenged China's treatment of U.S. auto parts exports. The ruling in this case resulted in China having to change its policies and increase its openness to U.S. exports. The United States (joined by Mexico and the European Union) has also initiated an action challenging China's use of subsidies and taxes to keep input costs low for firms in China, which lowers the cost of final goods from China relative to the world. Further, the Administration takes very seriously the "Special 301" process under which it monitors the protection and enforcement of intellectual property rights. In 2009, it added Canada to the priority watch list because Canada has not implemented key proposals to improve enforcement and protection of intellectual property rights. Actions like these represent the Administration's intent (made explicit, for example, in United States Trade Representative Ronald Kirk's speeches<sup>5</sup>) to enforce trade rules and aggressively pursue actions to open markets to U.S. exports.

As noted in Chapter 4, the Administration is currently pursuing these and other options to expand American exports, recognizing that increasing exports will be a key part of the U.S. growth model. Increases in our exports in the short run can help to return the economy to full employment. Over the longer run, increases in trade provide avenues for the United States to increase productivity through specialization, scale, and firm effects, and in turn, increase standards of living for American families.

Currently, a number of other trade expansion opportunities exist for the United States. The Administration supports a strong market-opening agreement for both goods and services in the WTO Doha Round negotiations and is continuing to work with U.S. trade partners on potential free trade agreements. Because the United States is a relatively open economy, negotiated trade deals often involve substantial improvements in access for U.S. exports to other countries relative to the market opening made by the United States.

It is also important that these trade frameworks protect productivity-enhancing innovation through adequate provisions for intellectual property rights and that they reflect our values regarding workers and the environment. An example of the Administration's actions to improve the world's trading regime is seen in the way the Administration is working to engage our trading partners across the Pacific region in a new regional agreement (the Trans-Pacific Partnership). It will be a high-standards agreement that expands trade in a way that is beneficial to the economy, workers, small businesses, and farmers, and is consistent with the values of the United States.

In addition to benefits to the United States, trade benefits our trade partners. This is of direct benefit to Americans in the sense that as these

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<sup>5</sup> See for example his speech at Mon Valley Works—Edgar Thomson Plant on July 16, 2009.

economies grow, they can grow as a destination for U.S. exports. Trade can also have large benefits for the poorest countries. In particular, multilateral agreements that open trade flows between developing countries can have substantial impacts on poorer countries, and trade relations with the United States can be a crucial part of the path to development for the poorest countries. For example, the African Growth and Opportunity Act seeks to increase two-way trade with poor nations in sub-Saharan Africa, help integrate these countries into the global economy, and do so in a way that improves their institutions and reduces poverty. As development in the poorest nations of the world is in our national interest strategically, economically, and morally, trade presents win-win opportunities to advance development.

### **ENSURING THE GAINS FROM PRODUCTIVITY GROWTH ARE WIDELY SHARED**

Any productivity advance—be it from technological change, trade, or other factors—will have different impacts across the economy. As discussed earlier, productivity advances are crucial to an increase in living standards. Still, those firms that do not make a specific advance will likely contract or fail, and some workers in the affected industry may face losses. Likewise, international trade can have disparate effects across industries, firms, and workers. In both cases, society on average will be better off because the economy is able to generate a higher standard of living. But the recent stagnation in median real wages despite positive productivity growth (discussed in Chapter 8) highlights the challenge of ensuring that the gains from productivity growth are widely spread.

The potential for productivity advances to generate disparities in outcomes suggests the need for strong social policy to support those who do not immediately benefit and to ensure that gains from trade and productivity advances are shared by all. Because identifying directly impacted individuals is difficult, the logical response to productivity advances is a strong social safety net that ensures that all benefit from the rise in living standards. Trade theory suggests that trade liberalization can generate gains that are large enough that they can be shared in a way that every member of society is made better off. In the past, however, the gains from our trade policies have not been shared sufficiently, and technological change and globalization have left many behind.

Trade adjustment assistance, worker retraining, and temporary relief programs are ways the Federal Government can and does support those

who do not benefit from these advances. The Administration has supported trade adjustment assistance, which provides additional unemployment funds, retraining, and health coverage assistance, and has made trade adjustment assistance available to a wider set of employees through the Trade and Globalization Adjustment Assistance Act of 2009.

These specific institutions, though, are not enough. More broad-based policy must ensure that as the economy grows in the long run, it enhances living standards for all citizens. Progressive taxation—which can be justified in many ways—is supported by the uneven outcomes from productivity advances and globalization. Those whose incomes rise can pay a larger share of total taxes and still be better off than before the gains. By doing so, they support lower taxes for others whose incomes may have declined. This process makes everyone better off and thus supports innovation and open borders by minimizing the number of people who feel threatened by productivity advances and therefore oppose them.

For example, the ability to sell books across borders certainly enhanced the income J.K. Rowling was able to collect from writing the famous Harry Potter books. Had she been able to sell her books only in the United Kingdom, her audience and income would have been much smaller. In addition, millions of American readers benefited from the increased consumer choice and the ability to purchase her books. Similarly, more Americans can work as well-paid aircraft engineers or manufacturing employees for Boeing or as technology specialists for Apple because those firms are able to sell on a world market. At the same time, it is distinctly possible that some American authors who would have captured a larger share of the “magic-oriented book” market had there been no trade in literature were crowded out by Rowling’s success, or that some handheld music device engineer in the United Kingdom has had to find another career because of Apple’s success.

A progressive tax rate combined with trade allows those who realize substantial income gains from globalization to still prosper a great deal relative to the state where there is no trade and incomes are taxed at a flat rate. And it does so while making sure that those who face lower incomes from globalization also obtain benefits—not just through the lower prices and expanded choices associated with trade, but also through lower taxation.

Beyond a progressive tax rate, a strong social safety net can cushion the disruption generated by a dynamic economy. Unemployment insurance can provide temporary income. A robust health care system can ensure that temporary dislocations do not generate drastic consequences. And a vibrant education system can prepare workers for changing economic needs.

## CONCLUSION

Advances in productivity are crucial to increasing the living standards of all Americans—to building a better future. Innovation initiatives, such as increased research and development, targeted investments, stronger intellectual property rights, and harnessing trade’s productivity-enhancing potential, are all essential parts of lifting living standards in the long run. But to ensure living standards are rising for all, a dynamic open economy depends on a robust social infrastructure. Education improvements described in Chapter 8 are crucial to creating a well-trained labor force able to thrive in a flexible economy where innovation and trade may reshape industries over time. A sound health care system is needed to provide the certainty that changing jobs will not mean a loss of health services. And a productive, well-regulated financial system is essential to allocate capital to growing sectors. Thus, the initiatives being taken today as part of the Administration’s rescue-and-rebuild programs are not meant only to correct the problems of today, but to set the stage for strong growth over decades to come.



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## CHAPTER 9

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