

# Structural Challenges and Opportunities in the U.S. Economy

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November 5, 2014

*As prepared for delivery*

It is great to be back at the London School of Economics. I learned an enormous amount studying here more than twenty years ago and I continue to apply those lessons in my work today. This evening, I want to discuss “Structural Challenges and Opportunities in the U.S. Economy.” In particular, I want to address three aspects of the United States economy. The first is the economic recovery at present. The second is the evolution of longer-term trends that have resulted in three fundamental challenges facing middle-class incomes: productivity growth, inequality, and labor force participation. Finally, I would like to conclude with three structural opportunities that can help address these challenges: the slowing growth of health care costs, shifts in energy production and consumption, and the implications of new technologies. Let me start with the current state of the recovery.

## **The U.S. Economic Recovery**

The global financial crisis left the United States, like many other countries around the world, with significant obstacles to a rapid rebound. But the United States has nonetheless recovered at an increasingly rapid rate. The headwinds we faced included weak bank balance sheets that constrained credit supply, highly indebted consumers who reduced their demand for credit, and substantial investment overhang in key cyclical sectors like housing. The financial crisis was followed and compounded by the less-widely recognized factor of unprecedented State and local government spending cuts that have acted as a drag on growth, subtracting 0.4 percentage point per year from GDP growth relative to a typical economic recovery. A range of global shocks have also restrained the recovery, including the euro crisis and ongoing economic challenges in Europe, the slowing of Chinese economic growth, and the Japanese earthquake disaster. In addition, domestic shocks like Superstorm Sandy in 2012 and the government shutdown in 2013 also impacted the recovery.

### *The Recovery in GDP and Labor Markets*

While there is still more work to do, the U.S. economy has seen its recovery continue to strengthen despite these challenges. Of the 15.5 million people put back to work in high-income OECD economies since late 2009, more than half of them are in the United States—which is even more remarkable because the United States is home to only about 30 percent of the working-age population in this group. Our real GDP per working-age population exceeded its pre-crisis peak in mid-2012, 4½ years after the onset of the recession. Many of the other countries that experienced crises have yet to achieve that benchmark, or have only done so more

I want to thank Eric Van Nostrand for extraordinary assistance as well as acknowledge the help of Matt Aks, Lydia Cox, Matt Fiedler, Martha Gimbel, Sam Himel, Josh Linn, Krista Ruffini, and Tim Simcoe.

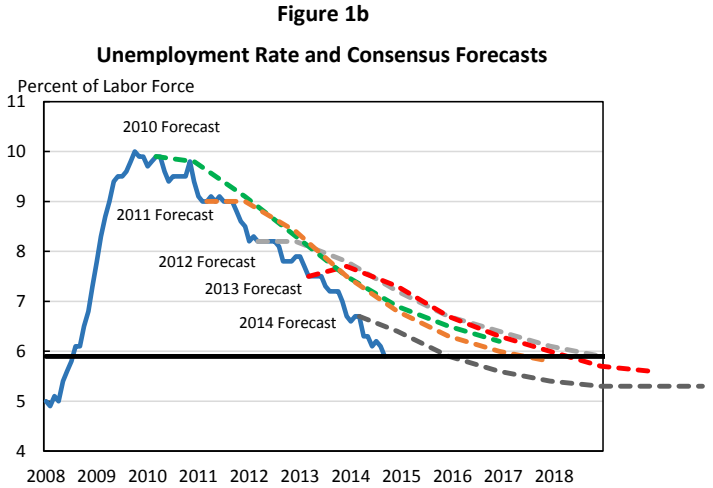
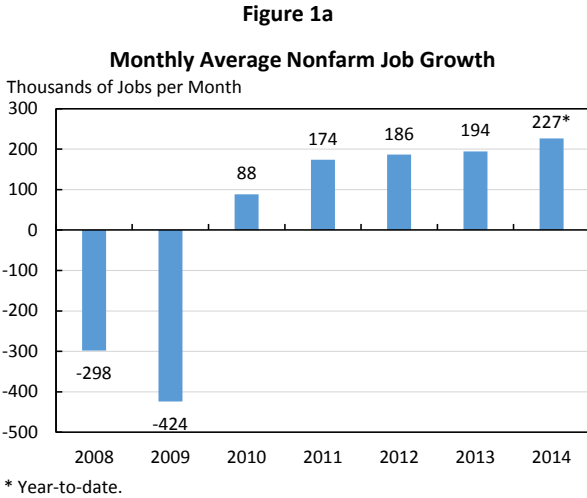
recently. For example, here in the United Kingdom where exposure to the euro crisis was greater, you just surpassed your pre-crisis peak this year.

Moreover, the United States has seen the pace of its recovery strengthen. In 2013 and to date in 2014, the U.S. economy grew at a 2.6 percent annual rate, up from the 2.1 percent annual rate in the previous 3½ years of the recovery, as shown in Table 1. This pick-up represents a strengthening of consumer spending and reduced fiscal drag from State and local governments—although all of this has been partially offset by a slowdown in residential investment, exports, and an increased Federal drag stemming from sharp cuts in discretionary spending in 2013. I should note that over the past year, the Federal component of GDP has largely stabilized as a budget deal undid a substantial fraction of the sequester for FY 2014 and 2015, while also reducing the uncertainty around the near-term path of fiscal policy.

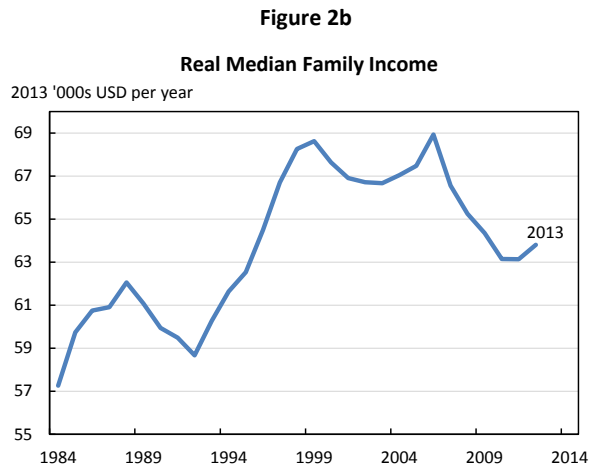
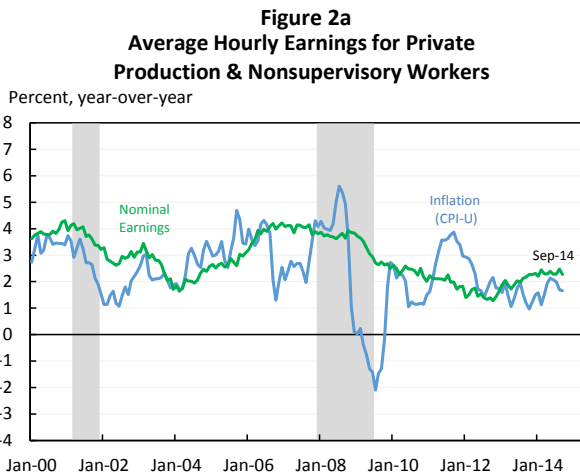
**Table 1**  
**Components of Real GDP Growth**  
**(percent change at an annual rate)**

	Start of Recovery (2009:Q2-12:Q4)	2013 and 2014 (2013:Q1-14:Q3)
<b>Gross Domestic Product</b>	<b>2.1</b>	<b>2.6</b>
Consumer Spending	2.0	2.4
Business Fixed Investment	5.2	5.1
Residential Investment	5.9	4.6
Exports	7.4	4.1
Imports	6.8	3.0
Federal Gov't	-0.6	-2.5
State & Local Gov't	-2.2	1.2

The recovery's strength is particularly pronounced in the labor market. We have seen 55 straight months of private-sector job growth. That is the longest streak in U.S. history. The pace of total job growth has risen to 227,000 per month so far this year, up from 194,000 per month in 2013 as shown in Figure 1a. That is a 2 percent annual rate of increase in total non-farm jobs in 2014, up from a 1.7 percent increase in 2013. That rate corresponds to above 50,000 jobs per month in the UK, slightly lower than your recent pace of job growth. From its 2009 peak through September 2013, the unemployment rate fell 0.7 percentage point per year. In contrast, over the last twelve months, the unemployment rate has declined by 1.3 percentage point, nearly the fastest pace in 30 years. As recently as 2013, most forecasters expected that the unemployment rate would not fall below 6 percent until 2017—but last month, it fell to 5.9 percent, as shown in Figure 1b. Furthermore, over the entire recovery the decline in the official unemployment rate has been matched by declines in broader measures of unemployment that include discouraged workers and other marginally attached workers (those who would like a job but are not currently looking). Moreover, the labor force participation rate has been effectively stable for the last 11 months. Involuntary part-time employment, however, remains a challenge.



These improvements have started to translate into wage gains for typical workers. Average earnings for production and nonsupervisory workers, shown in Figure 2a, reflect a sample that represents roughly the bottom 80 percent of workers and function as a reasonable proxy for median wages. Real earnings have risen more than 1 percent per year over the last two years. This wage growth, however, still falls well short of where it should be. Moreover, several decades of structural challenges followed by the Great Recession have resulted in real median family income in 2013, shown in Figure 2b, that was no higher than in 1997—a point to which I will return.



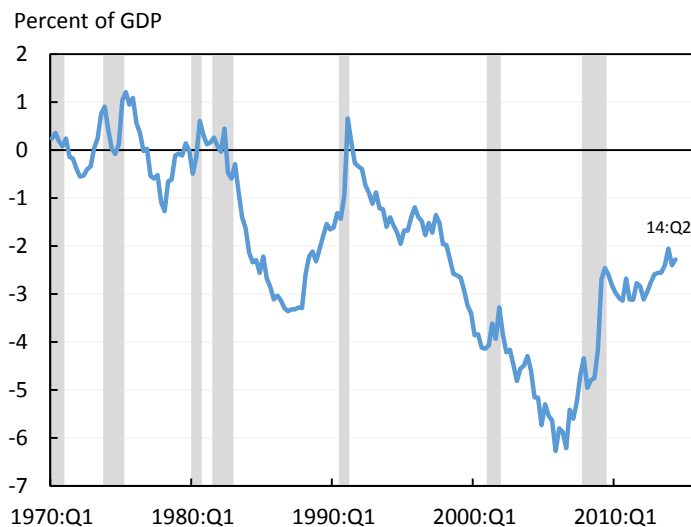
*The U.S. Macroeconomic Rebalancing*

While the United States has increased output and employment, it has also improved a number of long-standing structural imbalances, although more progress is needed in many of these areas. We have not just papered over the problems of the financial crisis; rather, we are undergoing a set of secular improvements to build a more robust economy going forward. The United States has made progress on its indebtedness on four levels: in international trade as a net recipient of

global capital flows, in gross national savings as a result of reduced budget deficits, in our household sector, and in our private business sector.

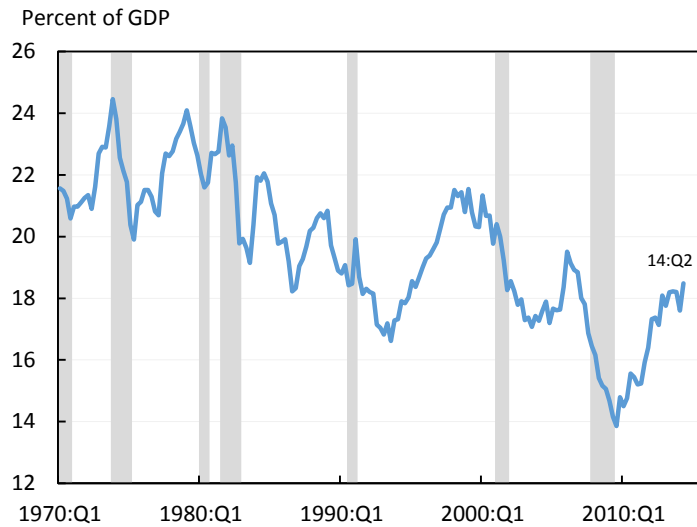
On the international side, the current account deficit—a measure of our net transactions with the rest of the world in goods, services, and income—rose steadily for nearly two decades, but fell in the Great Recession and has continued to drift down in the recovery. Recently, the deficit fell to just over 2 percent of GDP, the smallest share of the economy since the 1990s, as shown in Figure 3. Improving our net export position has reduced the pressure on components of domestic demand to prop up the U.S. economy. In the last decade, for example, the housing bubble was partially offsetting a growing trade deficit. Moreover, although the dollar’s reserve currency status gives the United States more of an ability to run a prolonged current account deficit—and, in fact, our net income on international assets has been positive this entire period—there is no doubt that a smaller current account deficit puts us in a more sustainable position going forward. This current account improvement is especially noteworthy given the United States’ advanced position in the business cycle versus its trading partners, which would tend to pull the current account further into deficit as U.S. import demand outpaces that of its trading partners.

**Figure 3**  
**Current Account Balance**



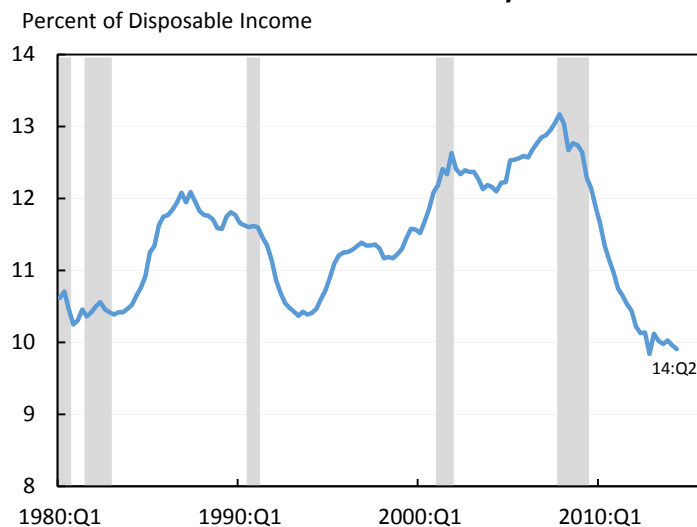
Domestically, gross savings have increased as a share of the economy, as shown in Figure 4. This is partly due to a jump in savings by the business sector and a personal savings rate that is generally higher than it was from the late 1990s to the onset of the Great Recession. But the sharpest change has been the reduction in Federal dissaving—specifically the reduction in the Federal budget deficit from 9.8 percent of GDP in FY 2009 to 2.8 percent of GDP in FY 2014, the fastest pace of deficit reduction since the demobilization after World War II. Although this rapid change has been a macroeconomic headwind—and as noted below we would have liked to have had more fiscal support—it will put us in a more sustainable position going forward.

**Figure 4**  
**Gross National Saving**



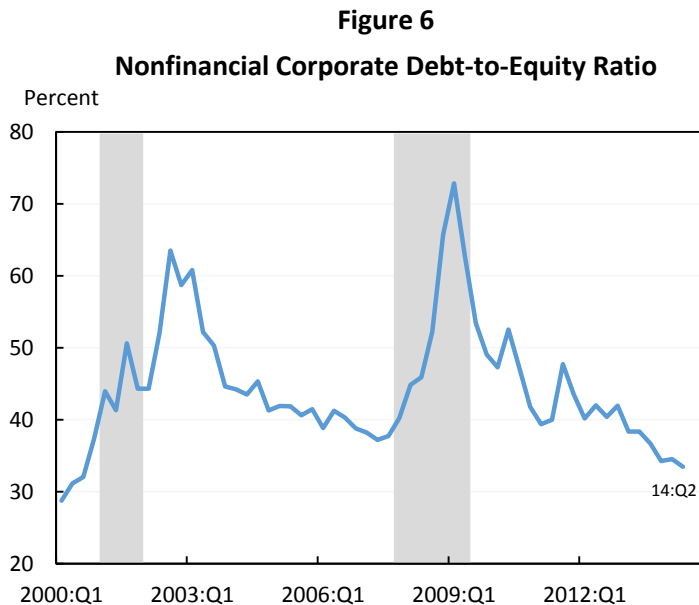
While many households still face challenges, in aggregate, the ratio of debt-to-disposable income in the household sector has decreased to a level last seen in 2002. The aggregate value of households' monthly debt service payments is now 9.9 percent of disposable income, the lowest level on record with data going back to 1980, as shown in Figure 5. Declines in real median household net worth now appear to have moderated, owing to lower levels of household debt and recovering asset values. But there is no doubt that the typical family faces greater challenges than the aggregate figures shown in Figure 5 would suggest.

**Figure 5**  
**Household Debt Service Payments**



America's corporate balance sheets have also partially shed their debt burdens. Bank capital is up more than 30 percent since the crisis, while the net worth of nonfinancial corporate businesses has risen more than 40 percent from its trough. Corporate debt-to-equity ratios in the non-

financial sector have retraced all of their increases from the crisis, and are now well below pre-crisis levels, as shown in Figure 6.



Of course, we are always concerned about persistent risks in the economy going forward. There is no question that the slowing global economy, when combined with the strengthening dollar, represents a headwind for the United States. But with exports representing only 13 percent of our GDP, we are much less exposed than many other countries. In the United Kingdom, for example, exports account for 27 percent of GDP and in Germany they account for 45 percent of GDP. On the domestic side, there has been some concern that valuations in certain financial asset classes are stretched, coinciding with a recent uptick in equity market volatility, although nothing like what was seen prior to the crisis. And while aggregate demand continues to strengthen, the unemployment rate cannot decline forever. Eventual labor market stabilization may deprive us of an important source of added demand that has pushed the economy forward for the past several years.

#### *The Role of Policy in the Economic Recovery*

I believe the United States is in this stronger position because, broadly speaking, we have gotten policy right. The United States passed its first round of fiscal support in February 2008, when the unemployment rate was still 4.9 percent and virtually no economist even realized the economy had already slipped into recession. The Recovery Act signed into law by President Obama a year later was the largest single countercyclical effort in American history and it was followed by a dozen additional fiscal-jobs measures that, together, peaked at more than 3 percent of GDP in 2010. Together with automatic stabilizers, the fiscal support to the economy totaled 5.5 percent of GDP.

But we would be in even better shape if we had not missed some important fiscal opportunities. The President sought additional fiscal measures that Congress did not act upon, including the American Jobs Act proposed in 2011, the extension of unemployment insurance benefits this

past year, increased upfront investments in infrastructure, and timely substantial relief from the sequester—all of which would have further accelerated the recovery.

The Administration's fiscal efforts were accompanied by accommodative monetary policy. The Federal Reserve cut the target Federal Funds rate to effectively zero at the end of 2008 and has kept it there ever since. On top of zero rates, the Fed implemented unconventional policy tools such as quantitative easing and forward guidance that have helped further extend the recovery.

These macroeconomic policies complemented the rescue of the financial sector through capital injections, an effective stress testing regime that helped to restore credibility to the system, and additional initiatives to support the automotive and housing sectors. All told, not only has the financial system been stabilized, but it has been done at effectively zero cost to the taxpayer, with the Troubled Assets Relief Program's (TARP) support for the banking sector actually proving to be a profitable investment for the federal government. These steps, together with Dodd-Frank Wall Street Reform and Basel III, have resulted in substantially healthier capital ratios for our banks and a more broadly robust financial system.

Altogether, Alan Blinder and Mark Zandi estimated that the combination of these macroeconomic and financial policies prevented the loss of a further 8.5 million jobs and prevented the unemployment rate from rising above 16 percent in the wake of the crisis.<sup>1</sup>

As the economy recovers, however, it has brought into sharper relief the long-standing, structural challenges we were facing even before the Great Recession, and in many cases the Great Recession only compounded these challenges. It is to these challenges—particularly the challenge of raising middle class incomes—that I will address next as I shift from this discussion of the present recovery to a brief review of the past sixty-five years.

## **A Brief History of Middle Class Incomes since World War II**

A fundamental test of an economy's performance is the improvement in well-being of its middle class. This in turn depends on overall economic growth, how the benefits of that growth are distributed, and access to jobs. There are a number of ways to gauge how the middle class is doing. For the sake of this discussion, I will focus on the average income of the bottom 90 percent of households, because it is available for a long time period and across a wide range of economies.<sup>2</sup> I will explore how it has been influenced by three factors: how income is distributed, how productivity has grown, and how many people are participating in the labor force. I consider how each factor has evolved over three post-war time periods.

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<sup>1</sup> Blinder, Alan, and Mark Zandi. 2010. "How the Great Recession Was Brought to an End." July (<http://www.economy.com/mark-zandi/documents/end-of-great-recession.pdf>).

<sup>2</sup> Our data are based on the nominal historical U.S. income data available at Alvaredo, Facundo, Anthony B. Atkinson, Thomas Piketty and Emmanuel Saez, The World Top Incomes Database, <http://topincomes.gmond.parisschoolofeconomics.eu>, November 2014. Nominal income data are deflated according the personal consumption expenditures chained price index. The income database is extended from 2012 to 2013 using the growth rate of the median household income published by the U.S. Census Bureau.

### *Brave New World: 1948 to 1973*

I will start with the period from 1948 to 1973, which I will term the “Brave New World.” All three of the factors moved to benefit the middle class over that 25-year period. The United States enjoyed rapid labor productivity growth, averaging 2.8 percent annually. Income inequality fell over this period with the share of income going to the top 1 percent falling by nearly a third, while the share of income going to the bottom 90 percent rose slightly. In addition, household income growth was fueled by the increase in women in the workforce. Prime age (25 to 54) female labor force participation rose from one-third of the population in 1948 to one-half by 1973. The combination of these three factors increased the average income for the bottom 90 percent by 2.9 percent per year over this period. At this rate, incomes double every twenty-four years, or about once every generation. I should say, of course, that as much as we may pine for this level of middle-class income growth and low overall income inequality, these factors certainly do not capture everything that is important; no one would want to go back to, for example, the levels of racial segregation or gender discrimination that prevailed in the 1950s.

### *Hard Times: 1973-1995*

Starting in 1973 and running through 1995, two of the three factors that had been driving middle-class incomes went off the tracks. I may be overstating the challenges by terming this period “Hard Times,” but no one has written a book called “Somewhat Harder Times.” Labor productivity growth slowed dramatically, rising at only a 1.4 percent annual rate over this period, in part due to the exhaustion of pent-up innovations from World War II, reduced public investment and dislocations associated with the oil shocks of the 1970s. Not only did the economy grow more slowly, but these smaller gains were distributed increasingly unequally—with the share of income going to the top 1 percent nearly doubling over this period, while the share going to the bottom 90 percent correspondingly fell. Average earnings in the bottom 90 percent declined over this period, by 0.2 percent per year. The only factor that prevented a larger fall in middle-class incomes was improving labor force participation, with the share of dual-income households rising as the surge of women into the labor force moved even faster than in the Brave New World era.

None of my argument rests on the claim that people in 1995 were worse off than in 1973 according to this one measure. Indeed, real median household income as measured by the Census Bureau rose by 0.3 percent per year during this period. And after the Congressional Budget Office (CBO) includes employer-paid health premiums and adjusts for changing family size, median income rose 0.4 percent per year (or 0.7 percent per year after taxes and transfers). The important point is that income growth dramatically slowed over this period. But all of these growth rates represent a substantial slowdown in progress for the middle class relative to what was achieved in the Brave New World era.

### *The Way We Live Now: 1995-2013*

Finally, the third period is “The Way We Live Now,” which I will define as 1995 to 2013, although it will take a longer historical perspective to understand whether and how the Great Recession and recovery fit into this period. Despite the worst recession since the Great



Depression, the average income for households in the bottom 90 percent rose over this period, at a 0.2 percent annual rate—however, it would take more than three centuries for incomes to double at this pace. When including employer-paid health premiums and adjusting for family size, the median income rose 0.4 percent per year according to CBO data, still considerably slower than in the Brave New World era.

Over this period, the trend of worsening inequality from the Hard Times era continued with the share of income going to the bottom 90 percent falling to 52 percent, well below the 68 percent of income it had garnered as recently as 1973. The other two trends reversed from the previous period. The labor force participation rate fell as women’s entry into the workforce plateaued and even started to drift down, aligning with the long-standing secular decline in prime-age male participation. At the end of this period, the retirement of the baby boomers contributed to the decline in participation. But labor productivity growth rose to a 2.3 percent annual rate, near the rates achieved in the Brave New World era, fueled by a new economy that improved the production and use of information technology at a startling rate, leading to total factor productivity growth more than doubling from the previous period.

**Table 2**  
**Middle-Class Income Growth and Its Determinants in Three Periods**

	<i>Brave New World</i> 1948-1973	<i>Hard Times</i> 1973-1995	<i>The Way We Live Now</i> 1995-2013
<b>Middle-Class Income Growth (annual rate)</b>			
Average Income for the Bottom 90%	2.9%	-0.2%	0.2%
Median Household Income	N/A	0.3%	0.5%
Median Household Income incl. Benefits <sup>3</sup>	N/A	0.4%	0.4%
<b>Productivity Growth (annual rate)</b>			
Labor Productivity	2.8%	1.4%	2.3%
Total Factor Productivity	1.9%	0.4%	1.1%
<b>Income Shares</b>			
Top 1 Percent	11% → 8% -0.1 pp/yr	8% → 14% +0.3 pp/yr	14% → 19% +0.3 pp/yr
Bottom 90 Percent	66% → 68% +0.1 pp/yr	68% → 59% -0.4 pp/yr	59% → 52% -0.4 pp/yr
<b>Labor Force Participation Rate</b>			
Overall	65% → 73% +0.3 pp/yr	73% → 83% +0.5 pp/yr	83% → 81% -0.1 pp/yr
Prime Age Male (25-54)	97% → 95% -0.1 pp/yr	95% → 92% -0.2 pp/yr	92% → 88% -0.2 pp/yr
Prime Age Female (25-54)	35% → 52% +0.7 pp/yr	52% → 76% +1.1 pp/yr	76% → 74% -0.1 pp/yr

<sup>3</sup> The CBO’s measure of median household income is adjusted for both family size and employer-paid health benefits.

As productivity, participation, and the income distribution evolved over the past 65 years, income growth went from doubling once in a generation to being roughly flat. Four counterfactual thought experiments give a sense of the magnitudes involved in this dramatic change:

- The impact of higher growth. What if total factor productivity growth from 1973 to 2013 had continued at its pace from the previous 25 years? In this case, incomes would have been 58 percent higher in 2013. If these gains were distributed proportionately in 2013—that is to say, if we had the same rise in inequality—then the median household would have had an additional \$30,000 in income. (Note that to the degree that higher productivity growth would have further exacerbated inequality, this thought experiment overstates the benefits of higher growth.)
- The impact of greater equality. Instead, what if inequality had not increased from 1973 to 2013, such that the share of income going to the bottom 90 percent remained the same? Even using the actual slow levels of productivity growth over that period, the income for the typical household would have been 18 percent higher, or about \$9,000 per year.
- The impact of labor force participation. What if female labor force participation had continued to grow from 1995 to 2013 at the same rate that it did from 1948 to 1995? Assuming that the average earnings for working women were unchanged, and maintaining the actual histories of productivity and the income distribution, the average household income would earn 7 percent more, an additional \$4,000.
- The combined impact of all three factors. Finally, if all three factors aligned—if productivity grew at its Brave New World rate, inequality did not increase, and participation continued to rise—then these effects would have been compounded and the typical household would have seen a 99 percent increase in its income. That is an additional \$52,000 per year.

**Table 3**  
**Impact of Sustained Growth in Productivity, Equality, & Participation**

Thought Experiment	Factor	Base Period	Percentage Impact on 2013 Average Income	Income Gain to 2013 Typical Household <sup>4</sup>
Impact of Higher Growth	Total Factor Productivity Growth	Brave New World (1948-73)	58%	\$30,000
Impact of Greater Equality	Share of Income Earned by Bottom 90%	1973	18%	\$9,000
Impact of Labor Force Participation	Female Labor Force Participation Rate	Brave New World & Hard Times (1948-95)	7%	\$4,000
<b>Combined Impact</b>	<b>All of the Above</b>		<b>99%</b>	<b>\$52,000</b>

<sup>4</sup> The first and third thought experiments assume that income gains are distributed proportionately across all households.

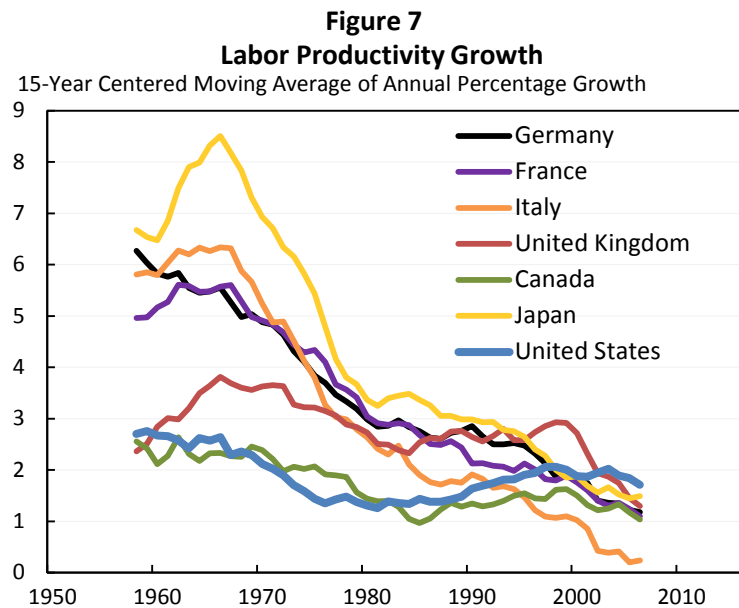
What I take from these thought experiments is that these three factors—productivity growth, inequality, and participation—matter. And the combination of the three, if you can get them going in the right direction, is especially powerful.

These three factors, then, constitute the fundamental challenges facing the future of middle-class incomes. I will turn next to putting them in an international context.

## The Three Fundamental Challenges for the Middle Class: An International Comparison

### *Labor Productivity Growth*

The first challenge is labor productivity growth, a key element underlying the growth of potential GDP and thus family income growth. This is a global issue. Recently, the OECD, IMF and other organizations have systematically lowered estimates for potential growth, and presumably for productivity growth, across most high-income countries as well as emerging economies. Over a longer window, the United States has been somewhat better situated than many other advanced economies, in part because we have been the center of much of the recent high-tech innovation. In fact, the United States has defied the trend in other high-income economies by seeing a pickup in productivity growth over the last 20 years, whereas productivity growth has generally fallen in most other high-income economies since the post-World War II period, as shown in Figure 7.



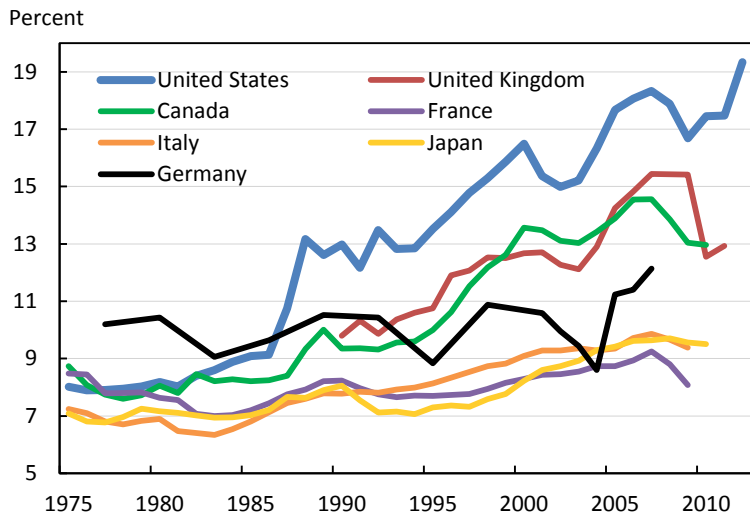
### *Inequality*

The second challenge is inequality. This, too, is a global issue, but it is one in which the United States is clearly worse situated than other advanced economies. In the United States, the top 1 percent has garnered a larger share of income than in any other G7 country, in all years where data are available since 1987, as shown in Figure 8. And the gap is worsening, as the top 1 percent gained income share at a faster pace in the United States than in any other G7 economy

for which data is available from 1987 to 2009. And while we lack comparable international data since 2009, the gains of the top 1 percent have continued in the United States since then. Overall from 1987 to 2011, the top 1 percent's income share rose 0.21 percentage point per year in the United States, versus 0.15 percentage point in the United Kingdom.

**Figure 8**

**Share of Income Earned by Top 1%**

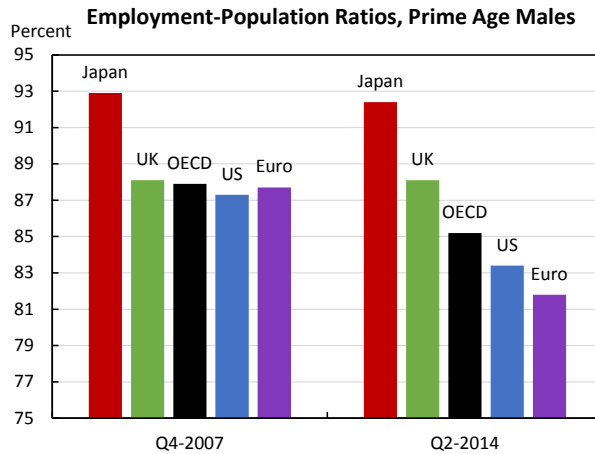


### *Labor Force Participation*

The third challenge is labor force participation. Although the United States has enjoyed a strong labor market recovery, we have seen our labor force participation rate fall, in contrast to many other high-income countries like the United Kingdom. The recent decline in the labor force participation rate is the result of demographic changes with the baby boom turning into a retirement boom starting in 2008 when the first boomers turned 62 and became eligible for Social Security. This was, of course, compounded by the severe recession that hit around the same time. But all of this came on top of an economy that already faced labor force participation challenges even before either of these events.

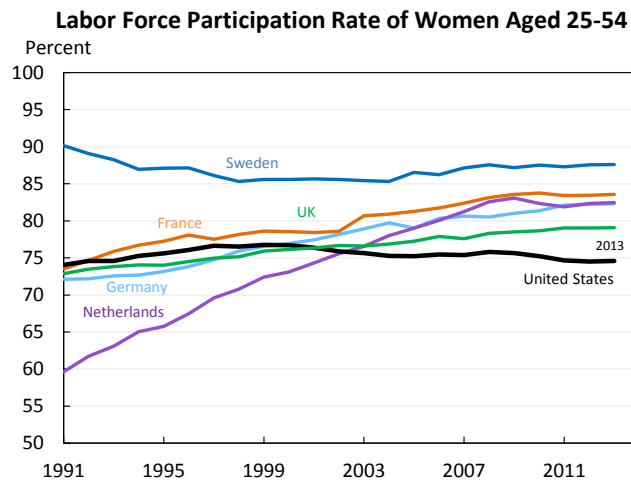
At the end of 2007, the employment-to-population ratio for prime age males in the United States was lower than that of the United Kingdom, the euro area and Japan—in fact, we ranked 23<sup>rd</sup> out of 34 OECD economies. The United States has seen a decline in the employment-to-population ratio since then, although the euro area has seen an even larger decline, as shown in Figure 9.

**Figure 9**



Historically, the United States showed leadership in bringing women into the workforce. In 1990, the United States ranked 7<sup>th</sup> out of 24 OECD countries in its prime age female labor force participation, slightly higher than the United Kingdom, and about 8 percentage points higher than the OECD average.<sup>5</sup> But since the mid-1990s, women’s labor force participation in the United States plateaued and even started to drift down while continuing to rise in other high-income countries, as shown in Figure 10. As a result, in 2013 the United States ranked 19<sup>th</sup> out of those same 24 countries, falling 6 percentage points behind the United Kingdom and 3 percentage points below the average in these countries. A recent study found that the relative expansion of family leave and part-time work programs in other OECD countries versus the United States explains nearly one third of this gap.<sup>6</sup>

**Figure 10**



<sup>5</sup> These countries are Australia, Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Japan, South Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Turkey, the United Kingdom, and the United States. Labor force participation includes workers who are on leave, including mothers who are on maternity leave. A similar pattern exists, however, when we look at the employment-to-population ratio.

<sup>6</sup> Blau, Francine D. & Lawrence M. Kahn. 2013. “Female Labor Supply: Why is the US Falling Behind?”, NBER Working Paper 18702, <http://www.nber.org/papers/w18702.pdf>.

The challenges of productivity growth, inequality and labor force participation are all substantial. But the U.S. economy has a number of structural opportunities that can help address all of them, although the degree to which we do will also depend on the policies that we choose to adopt. Which brings me to the last topic for today’s talk: the future.

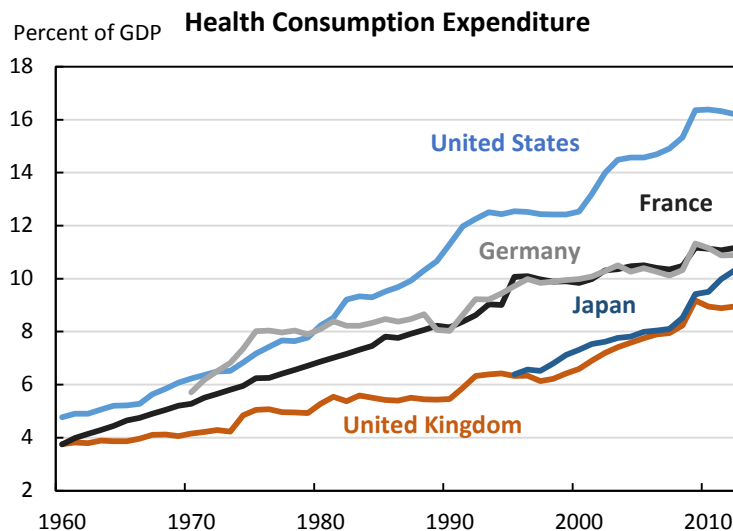
## Structural Opportunities

I want to highlight three structural opportunities for the U.S. economy: the structural reforms to our health system, the transformation of the energy sector, and the development of new technologies.

### *The Health Cost Slowdown*

Health care has historically been a drag on the U.S.’s economy performance. Health spending was 16 percent of the U.S. economy in 2012, the highest in the world and much higher than the 9 percent average for the OECD, which was also the share for the United Kingdom, as shown in Figure 11.<sup>7</sup> Despite this higher level of spending, the United States has historically provided insurance coverage to a smaller fraction of its population than other developed countries and failed to achieve better health outcomes. While there are a number of important differences between the United States and other countries—and we would not adopt the health systems from elsewhere—these numbers clearly illustrate that we can do better than we have done.

**Figure 11**

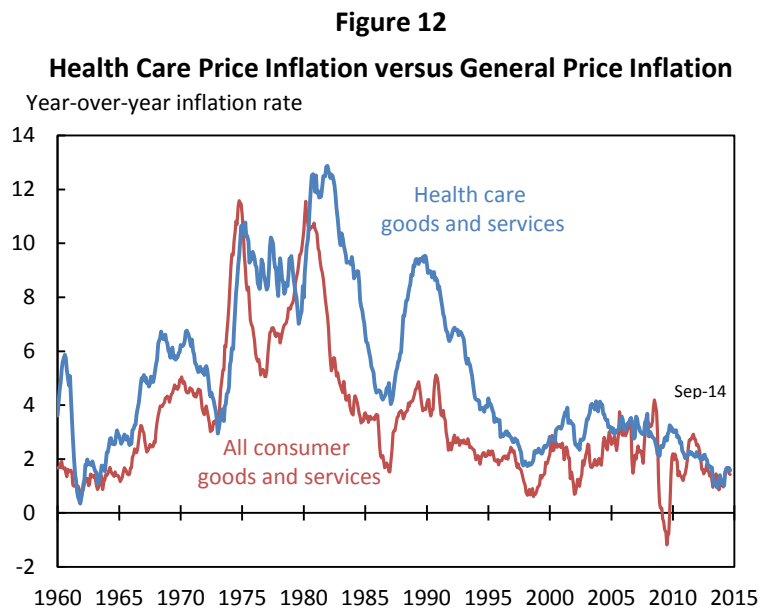


Until recently, the problem was not just that the United States faced a high level of health spending, but also that that spending was growing rapidly. A decade ago, the nominal health

<sup>7</sup> For comparison, health spending is measured according to OECD definitions. According to the broader definition typically used in the United States, health spending was 17 percent of GDP in 2012.

insurance premiums paid by employers were rising at double digit rates. The then-head of the Business Roundtable warned, “[t]here’s no question that rising health care costs are one of the biggest threats to families, businesses and U.S. competitiveness.”

Today, the situation has changed substantially. The average premium for employer-based family coverage grew 3 percent in 2014, and just 1.2 percent adjusted for inflation. That is tied for the lowest growth rate for premiums recorded since this survey began in 1999. Health care prices are growing at the slowest rate in nearly fifty years, as shown in Figure 12. And the three lowest years on record for the real growth of per capita national health expenditures are estimated to have been 2011, 2012 and 2013.

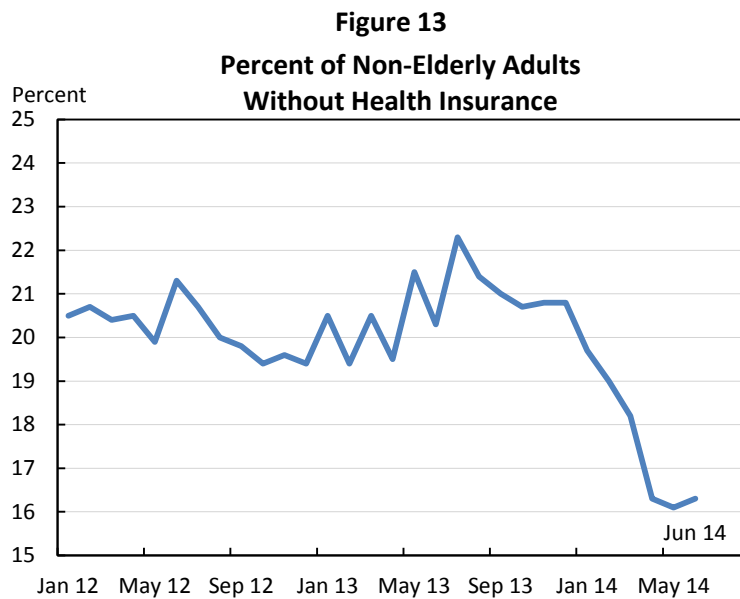


The slowdown has a number of causes. The deep recession is certainly one of them. When workers lost jobs during the recession, they often lost their health insurance coverage as well, and those who kept their jobs sometimes saw their health insurance benefits trimmed as employers strove to cut costs. But slow health care cost growth has continued into 2013 and 2014, even as the pace of economic recovery has improved, making it increasingly implausible that the recession is the only factor at play. Moreover, the recession cannot explain the slowdown in spending in Medicare, the U.S. government insurance program for the elderly and people with disabilities, whose beneficiaries are largely insulated from the business cycle.

It is thus clear that much of the slowdown is structural. The last several years have seen a steady stream of blockbuster drugs come off patent, while deductibles in employer coverage have risen steadily. Changes in the development and diffusion of costly (but not necessarily high-value) new medical technologies, and initial efforts by private sector actors to shift away from fee-for-service payment systems have also played a role.

Structural reforms in the Affordable Care Act have undoubtedly contributed as well. Much of the attention around the Affordable Care Act has, appropriately, focused on its provisions to expand

health insurance coverage, the bulk of which took effect in January 2014 and had extended coverage to an estimated 10.3 million people by the middle of 2014, with many millions more likely to gain coverage in the years ahead. The coverage provisions have resulted in a 26 percent decline in the number of non-elderly uninsured adults in the United States during 2014, as shown in Figure 13. These coverage gains will, of course, add to growth in aggregate health care spending (though not spending per beneficiary) over the next few years as these newly insured individuals become able to access much-needed care. But the coverage portions of the law have not meaningfully affected aggregate spending trends over the last few years discussed above, nor are they the portions of the law likely to have the most important impact on the long-term trajectory of health care spending.

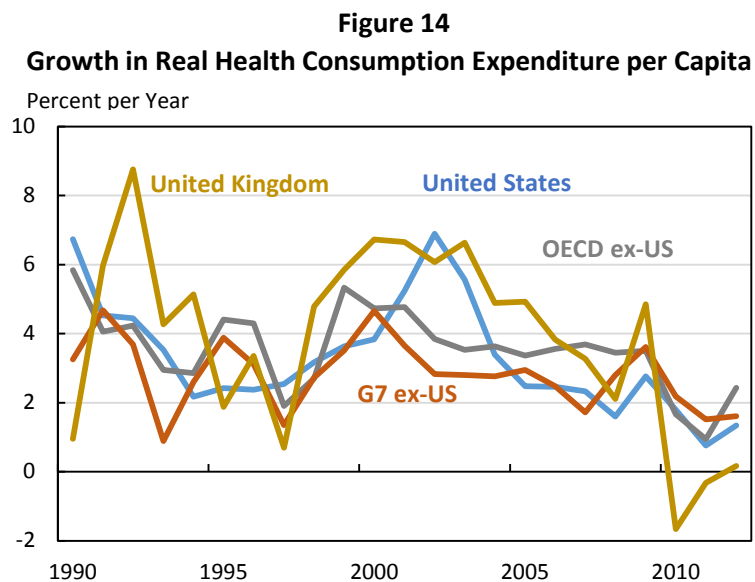


Instead, the most important effect on the long-term trajectory of health care spending will likely come from the Affordable Care Act’s cost and quality provisions. The ACA included a robust package of reforms to slow health cost growth and improve quality of care, including reducing excessive payments to medical providers through Medicare; shifting Medicare toward paying based on the efficiency and quality of care provided, rather than just the quantity of care provided; creating so-called Accountable Care Organizations to better integrate patient care across settings and providers; and setting up an Innovation Center with authority to test a wide variety of new payment models and then bring them to scale if they are shown to improve either costs or outcomes. While most of these reforms are in Medicare, which accounts for one-fifth of national health expenditures, historical experience suggests that many of these payment changes will be adopted by private insurers as well. If that had indeed occurred to the extent implied by some recent research, our estimates find that these reforms could have subtracted 0.5 percentage point per year from the growth of health care prices through 2013.

The United States is not the only country to see a sharp decline in health spending growth over the last few years. However, we had more rapid growth during the early-to-mid 2000s and a larger deceleration thereafter than most countries, though exceeded by the United Kingdom in



both those respects, as shown in Figure 14. This is consistent with the most recent sharp drop having been driven, at least in part, by the recession and some other common structural factors, like a slowdown in the development and diffusion of medical technologies. It also may reflect a shared interest among policymakers in slowing the growth of health costs. Further work determining which of these common factors have been most important will be worthwhile, particularly as internationally comparable data that extend further past the end of recession become available. For the time being, however, it is worth noting that the features of the health cost slowdown in the United States that point to an important role for structural factors—notably the persistence of the slowdown through the present—may suggest a similar conclusion about other developed economies.



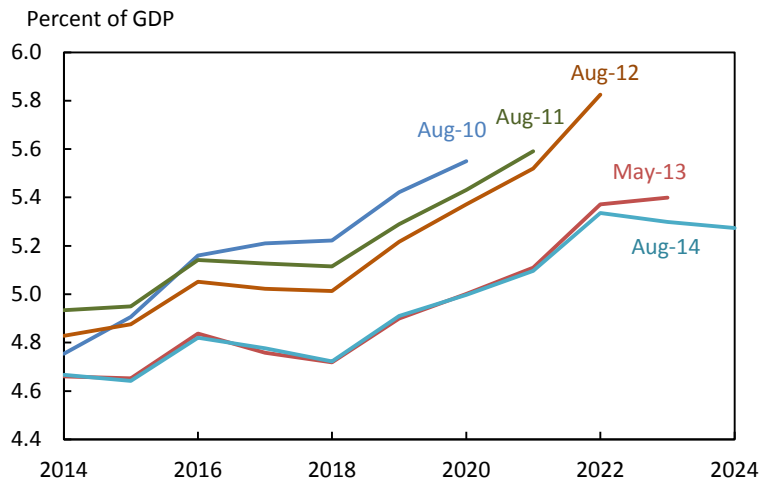
Any time you observe a big change and ask yourself whether it is temporary or permanent, the truth will often be some combination of the two. And while the uncertainty about what has happened to date is significant, the uncertainty in the outlook for health costs is many times larger. All that being said, I believe that the balance of the evidence implies that there is a meaningful, persistent component to the slowdown—in part because the Affordable Care Act’s reforms are continuing to phase in.

The implications for the American economy of a persistent slowdown would be large: if even just one-third of the slowdown persists, U.S. national health expenditures per person would be \$1,200 lower after a decade.

These savings would have far-reaching consequences. In the short and medium run, the portion of these savings attributable to people in employer-provided coverage will boost job creation by lowering unit labor costs. In the longer run, economic theory and evidence imply that the savings realized by employers will be fully passed through to households, generating large increases in workers’ take-home pay.

Savings of this magnitude would also have profound implications for the long-term budget outlook. An illustration of this comes from how budget projections have shifted in response to the slowdown observed to date. Since August 2010, CBO has reduced its estimate of combined Medicare and Medicaid spending in 2020 by 14 percent, or \$188 billion, one of the key reasons that our projected deficits have fallen so sharply, as shown in Figure 15. These savings are on top of the direct effects of the Affordable Care Act, which the agency previously estimated would shave more than \$100 billion from deficits over the law’s first ten years and reduce deficits by an average of 0.5 percent of GDP per year over the following ten years.

**Figure 15**  
**Recent Congressional Budget Office Projections of Medicare and Medicaid Outlays**



These health-related savings, together with legislation passed in 2011 to constrain spending and in early 2013 to raise tax rates on high-income households, are the principal reasons that CBO now estimates that the 75-year fiscal gap is 1.8 percent of GDP, well below its earlier estimates. And under the Administration’s estimates, which incorporate the effects of the President’s policies, the debt would be on a declining path as a share of the economy over the next 75 years.

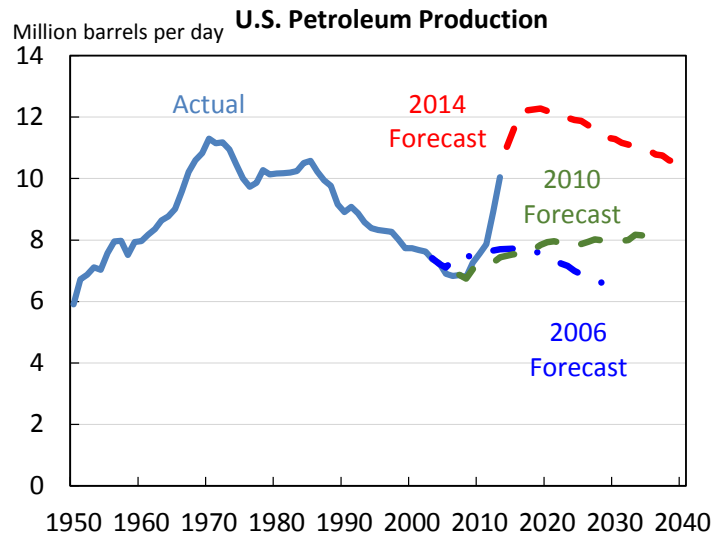
*The Transformation in the Energy Sector*

The second structural factor I will address is more widely appreciated and understood and has more direct ramifications for the global economy: the transformation of the American energy sector. The President’s approach to this is an all-of-the-above strategy which has three goals: contributing to jobs and growth, increasing our macroeconomic stability, and reducing carbon emissions. To that end, we have increased the production of oil and natural gas while also increasing the production of renewables and reducing the use of oil in particular and carbon more broadly. In addition, we have a number of measures in progress that will further reduce carbon emissions. Let me quickly discuss some of these sectors and their implications for our broader goals.

We have seen large changes in the production and consumption of energy:

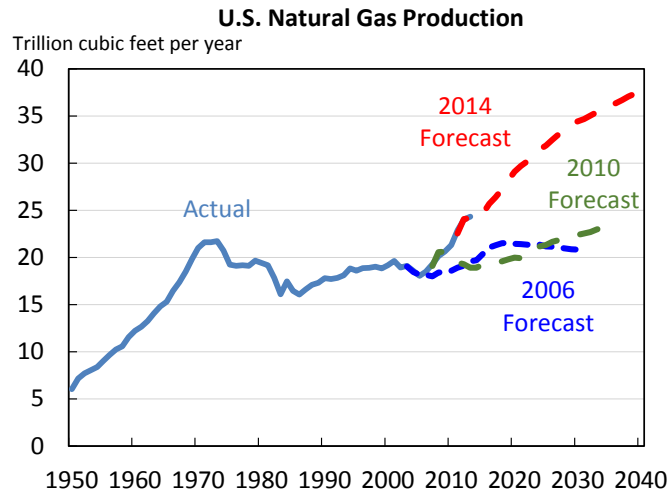
- Oil. As of July, the United States is the largest oil producer in the world (including crude and other liquids) exceeding Saudi Arabia and Russia. In the last eight years we have added 3.5 million barrels per day to U.S. oil production, the equivalent to discovering a new Iraq in the United States. About 80 percent of recent production growth comes from nonconventional oil fields in North Dakota and Texas. And the Energy Information Agency (EIA) has continually upped its projections for future supply as well, as shown in Figure 16. At the same time, we have cut our consumption of oil by 1.8 million barrels per day, the equivalent of no longer needing the annual oil production of Angola or Norway. The recession contributed to lower oil consumption, but the increased fuel economy of the vehicle fleet has also played an important role: U.S. gasoline consumption has fallen 5 percent since 2006 even though our economy is 25 percent larger.

Figure 16



- Natural gas. The revolution in nonconventional natural gas extraction has sharply increased natural gas production, with the United States also the world's leader in this regard. Already, well over half of natural gas production is from nonconventional plays (tight gas and shale gas), a fraction that is projected to increase. Like the increase in oil production, the increase in gas production was unforeseen, and EIA continually updated its projections of future supply, as shown in Figure 17. Higher gas production and lower prices have allowed consumers to substitute gas for other fuels, which has been particularly dramatic in the power sector, where gas consumption has increased by 24 percent since 2008 while coal consumption decreased by 17 percent through 2013.

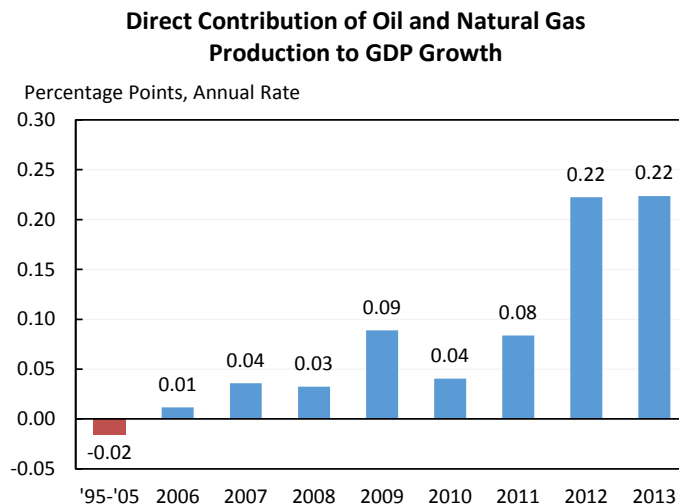
**Figure 17**



- **Renewables.** Electricity generation from renewables is soaring as well: wind generation has tripled since 2008 and utility-scale generation from solar is up more than tenfold. In 2013 wind power accounted for about 4 percent of total generation, versus only 2.4 percent in 2010. And new installations of solar photovoltaic systems now rival the amount of wind and natural gas capacity being added to the system. Dramatic technological progress for solar, as well as policies at the local, State, and Federal levels have supported this growth in wind and solar. One recent estimate found that solar-generated electricity will reach cost parity with conventional electricity in 36 States by 2016. Employment in these industries has expanded as well, with about a 50 percent increase in solar employment between 2010 and 2013.

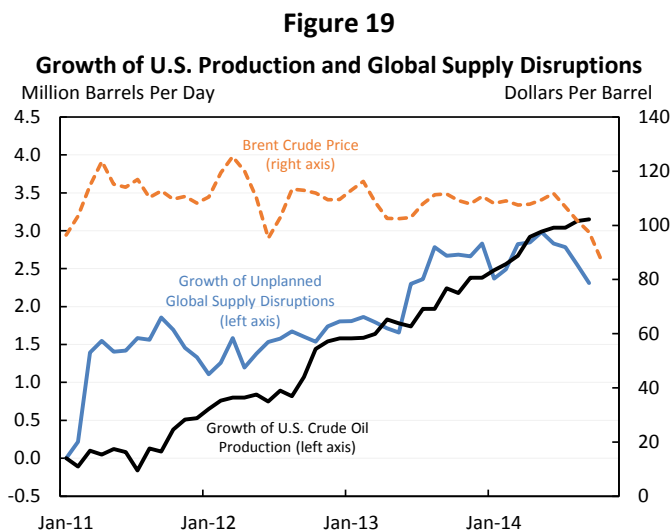
These changes have advanced all three goals of the all-of-the-above energy strategy. They are contributing to economic growth and job creation. If you measure just the *direct* contribution of oil and gas production, it is adding an increasing amount to growth, as shown in Figure 18. Moreover, these estimates are conservative in that they do not account for spillovers.

**Figure 18**

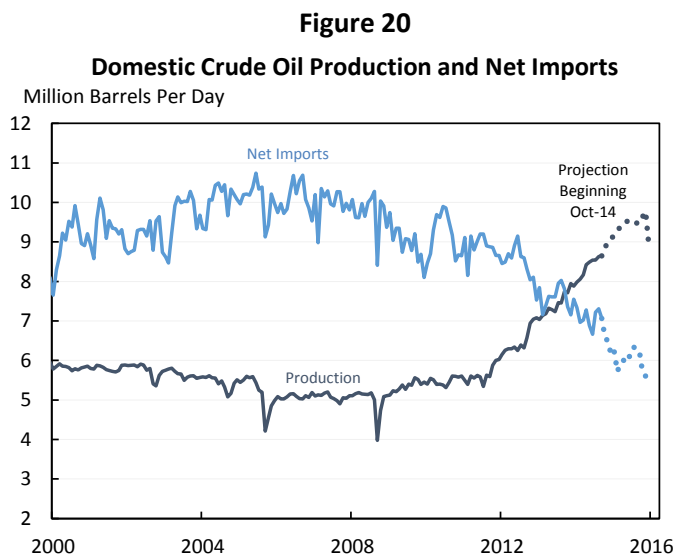


In addition to this direct effect on production, the increased supply of U.S. oil is contributing to lower prices. These in turn help increase both U.S. and global growth through a multiplier effect as, for example, consumers pay less for gasoline.

These developments have also enhanced U.S. energy security. It is notable that despite substantial turmoil in the Middle East, the increases in U.S. oil production over the past three years have roughly offset the reductions in supply from the Middle East, as shown in Figure 19.



Overall, the combination of increased oil production and reduced oil consumption means that the United States now produces more oil than it imports, as shown in Figure 20. In June 2005, net crude oil imports stood at 10.7 million barrels per day and were projected to rise still further. But net crude oil imports actually peaked in that year, and by June 2014 imports had fallen 40 percent to 6.7 million barrels per day. In fact, net imports of total petroleum products are on pace to decline more than 50 percent from their peak by the end of the year.



The price of oil will always be set on world markets, meaning all countries in the world are vulnerable to global events. But increased domestic production means that we have reduced some of that vulnerability in the United States. Reduced imports mean that we are less subject to a global terms-of-trade shock; any increases in the world price of oil will not transfer as many resources from the United States to foreign countries. This helps to reduce the impact of oil supply disruptions on the U.S. economy, as we demonstrated in a recent Council of Economic Advisers report on the President's all-of-the-above energy strategy.

Finally, the United States has cut carbon emissions by 10 percent from 2007 through 2013. About half of these emissions reductions are due to the recession but the other half—still a substantial amount—are due to all of the changes I have been discussing, including the shift from coal to natural gas, the increased use of renewables, and the increased energy efficiency of our fleet.

Many of the emissions reductions we have seen or will see stem from the President's Climate Action Plan along with earlier steps including substantial energy investments in the Recovery Act, new standards for emissions from passenger vehicles and trucks, and a range of other efforts from eliminating hydro-fluorocarbons to reducing methane emissions and encouraging more solar deployment. Our support of clean energy innovation, like advanced solar, renewable fuels, and electric cars, will help reduce emissions not just in the United States but around the world.

Perhaps most importantly, the Environmental Protection Agency (EPA) has released draft rules to reduce carbon emissions by 30 percent in 2030 from the power sector, which is responsible for 32 percent of U.S. carbon-equivalent emissions. Overall we are on track to meet our Cancun commitment to cut greenhouse gas emissions in the range of 17 percent below 2005 levels by 2020. And these efforts strengthen our position to secure similar commitments from other nations.

### *The Growth of Technology*

Technological innovation plays an important role in the transformation of the health and energy sectors. But, of course, technological change has impacts that extend far beyond those two sectors. For an advanced industrial economy such as the United States, innovation is necessarily the wellspring of economic growth—catching up to the productivity frontier is not an option when you are already there. Thus, the third structural opportunity I will discuss today relates to investments in innovation and our efforts to ensure that those investments are as productive as possible.

As a starting point, I should note that the federal government has a long tradition of support for technological research and development, a clear example of a pure public good that merits substantial subsidies because the social benefits far exceed the private benefits. For 2012, the National Science Foundation (NSF) estimates that total federal R&D spending was \$141 billion. This figure is down slightly from a 2010 peak of \$147 billion, largely due to the withdrawal of one-time expenditures linked to the Recovery Act.

The long-term benefits of both private and public investment in science and engineering are evident in the way that technology is creating new industries and transforming old ones throughout the economy. Some of the most visible changes are occurring in the information and communications technology sector, where a combination of smaller, more powerful computing and communications devices as well as improvements in mobile broadband connectivity have unleashed a new wave of development in applications. Moreover, those who watch and predict developments in this sector suggest that we are on the cusp of a full-fledged “internet of things,” where it is not just your smartphone that is always connected to the network, but also the lights and thermostat in your home, your car keys (which will become much easier to find when misplaced), and even your heart rate monitor.

While many of us feel the impact of the computing revolution every day, many scientists say that we are also on the cusp of a revolution in life sciences. The first complete human genome was sequenced in 2003 at a cost of roughly \$3 billion, but today it can be done for as little as \$1,000 per person. Some medical researchers tell us that we stand poised to enter an era in which personalized medicine meets evidence-based medicine: a patient’s genomic information, when combined with insights from both basic and clinical research, could soon help doctors to diagnose and treat a variety of both present and latent diseases by selecting or even designing the drugs that would be most effective, given that individual patient’s condition, medical history, and genome. While I remain circumspect because much more investigation is needed before we can fully appreciate the benefits of this development, the medical potential here is truly incredible.

Transformations similar to those that we see in mobile computing and health are occurring throughout the economy, for instance, in other areas such as advanced materials and renewable energy generation. Progress in the domain of nanotechnology holds tremendous potential at the intersection of these two areas: the efficiency of both energy consumption and production can be greatly improved using new materials for light bulbs, insulation for wiring, combustion engines, and photovoltaic cells, to name just a few.

The Administration’s policies are contributing in all of these areas. We are working to nearly double the amount of spectrum available for mobile broadband, both by reallocating private spectrum and freeing up public spectrum. We have made openness and interoperability the new defaults for government data, and moved to ensure that the data and findings of all government funded research are freely available to the public within a year of publication. And we are working to ensure that our patent and copyright laws, which help drive the creation and commercialization of new ideas, are well-suited to the modern age.

There are good reasons to believe that we are witnessing changes that are having a major impact on technology and our future. However, this observation forces us to consider whether we can actually see the fruits of these policies in the productivity statistics. At this point, the answer is unfortunately not completely clear.

Robert Gordon, for example, famously argues that none of the gadgets we are so excited about is particularly transformative and that we should not expect anything better than mediocre productivity growth going forward. On the other side, Erik Brynjolfsson and Andrew McAfee have argued that the pace of technological change and productivity growth is accelerating. And

of course this debate is not a new one—it has been almost 30 years since Robert Solow famously quipped that “[y]ou can see the computer age everywhere but in the productivity statistics.” While I do not expect to resolve these debates today, I would like to conclude this discussion of innovation policy by making three points about the relationship between innovation and productivity:

First, in a sense we *have* seen changes in the data. Productivity data are extremely noisy due to measurement errors in both the numerator (output) and the denominator (hours). And because the data are strongly cyclical it is important to use a long time-window to smooth out fluctuations. If you look at a 15-year moving average of labor productivity growth, as shown in Figure 7 above, you can see that we remain near a high point. Certainly the 2.3 percent labor productivity growth from 1995 to 2013 greatly exceeded the 1.4 percent growth rate from 1973 to 1995 and was close to the 2.8 percent growth rate from 1948 to 1973. None of these summary statistics prove anything, of course, but we may simply need more time to understand whether slower reported productivity growth over the last decade is a departure from the new economy that pre-dated the Great Recession, as research by John Fernald has suggested, or a more idiosyncratic phenomenon that is related to the Great Recession itself.

Second, even if we have not seen higher productivity growth in the official data, that could be because the official data are not designed well to measure improvements in quality and variety, especially in information services, and so are systematically understating productivity growth. For example, much of the internet runs on open-source software, which is freely available, and therefore does not show up as part of output or the capital stock in official statistic, even though such software surely adds great value to the overall economy. Likewise, the variety of both information and goods that can be accessed via the internet better satisfy the full range of tastes of a broader distribution of consumers, even if we cannot always quantify how much more fully their needs were met.

Finally, it is important to recognize that it often takes time for technical breakthroughs to appear in the productivity statistics because current technologies are often deeply embedded in our stock of physical, human, and organizational capital. For example, the economic historian Paul David has described how electrification led to the radical redesign of many factories and industrial work processes, which shifted from being vertical and urban to horizontal and exurban. It seems reasonable that similar processes of industrial reorganization will produce lags in realizing the full growth-inducing potential of new technologies such as mobile computing, robotics, and genomic sequencing. The original “productivity paradox” debate over the importance of information technology calmed down shortly after Solow’s famous quip, largely due to the increased rate of productivity growth during the 1990s. While I do not want to go too far here and predict a substantial jump in the rate of productivity growth, the idea that the next twenty years will look more like the last twenty years than the period of slower growth from 1973 to 1995 seems entirely plausible to me.

The technological transformation, however, has been one contributor to rising inequality. This does not mean we want less technology—but it speaks to the need for policies that can help make sure that more people have the skills to complement these technologies and can share in some of the aggregate benefits they create. Moreover, the power of the computer age can be a



tremendously leveling force. For example, widespread access to smartphones and free websites like Wikipedia gives access to information that even the wealthiest people would not have had twenty years ago. Moreover, computers, tablets, and smartphones have the potential to transform education, creating portable classrooms for students.

## **Conclusion**

The economic recovery in the United States is strengthening. We are growing our economy at a faster pace, creating jobs at a faster pace, and seeing the beginnings of real wage growth. But we face several fundamental challenges, most of them shared to varying degrees with the United Kingdom and many other high-income countries: the uncertainty around the future of productivity growth, the continued increase in inequality, and the reduced participation of many groups in the labor market. The American economy also has enormous strengths that can help us address these challenges, in the areas of health, energy, and technology that I have highlighted today.

Additional policy efforts will be needed to capitalize on these strengths and effectively confront our challenges. The President will continue to do everything he can, both acting on his own and working with Congress, to strengthen the economy and to ensure that more Americans share in the benefits of that economic growth.

His agenda includes policies designed to deepen our human capital stock and increase productivity growth like investing in research and infrastructure, reforming our immigration system, reforming the business tax system and expanding trade. It also includes policies to ensure that more people share in this growth like raising the minimum wage, expanding tax credits for low-income childless workers and noncustodial parents, promoting equal pay, and expanding education from preschool through job training. And many of these policies would simultaneously grow our economy and distribute its benefits more broadly. Because ultimately, the best strategy for growth is one that encourages the broadest range of Americans to participate in and contribute to our economy.

## Notes to figures and tables

### Table 1

Source: Bureau of Economic Analysis; CEA calculations.

### Figure 1a

Source: Bureau of Labor Statistics; CEA calculations.

### Figure 1b

Source: Bureau of Labor Statistics; Blue Chip Survey of Professional Forecasters.

### Figure 2a

Source: Bureau of Labor Statistics.

### Figure 2b

Source: U.S. Census Bureau.

### Figure 3

Source: Bureau of Economic Analysis.

### Figure 4

Source: Bureau of Economic Analysis.

### Figure 5

Source: Board of Governors of the Federal Reserve System.

### Figure 6

Source: Board of Governors of the Federal Reserve System.

### Table 2

Notes: All income measures use nominal data, deflated by the personal consumption expenditures price index. Income for the bottom 90% is provided by the World Top Incomes Database, cited below, median household income is provided by the U.S. Census Bureau, and median household income including benefits is provided by the Congressional Budget Office. Sources: Alvaredo, Facundo, Anthony B. Atkinson, Thomas Piketty and Emmanuel Saez, The World Top Incomes Database, <http://topincomes.g-mond.parisschoolofeconomics.eu>, November 2014; U.S. Census Bureau; Congressional Budget Office; Bureau of Labor Statistics; Bureau of Economic Analysis; CEA calculations.

### Table 3

Notes: The first and third thought experiments, which do not consider the income distribution, directly measure the impact on mean incomes. The impact on the median household for these thought experiments is calculated assuming that income gains are distributed proportionally such that the mean and median grow at the same rate. Put differently, the thought experiments assume that growth and participation do not further exacerbate income inequality. Source: CEA calculations based upon data presented in Table 2.

Figure 7

Source: Conference Board, CEA calculations.

Figure 8

Notes: Data for all countries exclude capital gains. For Germany, data excluding capital gains is unavailable after 1998, so this chart displays data including capital gains adjusted for the historical relationship between the capital-inclusive and capital-exclusive ratios.

Source: Alvaredo, Facundo, Anthony B. Atkinson, Thomas Piketty and Emmanuel Saez, The World Top Incomes Database, <http://topincomes.g-mond.parisschoolofeconomics.eu>, November 2014.

Figure 9

Source: Organisation for Economic Co-operation and Development.

Figure 10

Source: International Labor Organization.

Figure 11

Source: Organisation for Economic Co-operation and Development.

Figure 12

Source: Bureau of Economic Analysis; CEA calculations.

Figure 13

Source: Sommers, Benjamin D., Thomas Musco, Kenneth Finegold, Munira Z. Gunja, Amy Burke, and Audrey M. McDowell. 2014. "Health Reform and Changes in Health Insurance Coverage in 2014." *New England Journal of Medicine* 371: 867–74.

Figure 14

Note: Country averages are weighted by population. Countries experiencing a break in series in a specific year are excluded from averages.

Source: Organisation for Economic Co-operation and Development

Figure 15

Note: The plotted estimates reflect adjustments to CBO's original GDP estimates to reflect the comprehensive GDP revisions in July 2013.

Source: Congressional Budget Office; CEA calculations.

Figure 16

Source: Energy Information Administration.

Figure 17

Source: Energy Information Administration.

Figure 18

Source: Energy Information Administration, CEA calculations.

Figure 19

Source: Energy Information Administration.

Figure 20

Note: Projections from the Short-Term Energy Outlook, October 7, 2014.

Source: Energy Information Administration.