



The State of American Productivity Growth

Quarterly U.S. Productivity and Innovation Snapshot

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Introduction

Productivity growth—the rate at which we increase production with a given amount of work and resources—is at the heart of economic growth. It will be easier to address the myriad challenges facing the U.S. economy—increasingly fragile middle-class living standards, the long-term federal budget deficits, and increasing economic competition from rapidly developing countries—if productivity grows faster rather than slower and economic growth accelerates with it.

Productivity growth is critical to our national economic competitiveness. U.S. products and services are more competitive in the global marketplace when U.S. firms manage to produce more and better things with the same amount of inputs.

Productivity growth also boosts our future living standards. Simply put, productivity growth means we can have more goods and services available for a given amount of resources used—hours at work, in particular. Because productivity growth makes our work go further, the average standard of living can rise more quickly. To ensure broadly shared prosperity we still need to address how the gains from productivity growth are distributed between wages and profits, but we can't forget that rising prosperity begins with strong and sustained productivity growth.

A number of key factors come into play in determining faster productivity growth in the future. These include the level of business investment, the availability of skilled workers, spending on research and development, and adequate financing for bringing new and innovative products to market. The indicators of U.S. productivity and innovation surveyed here raise a number of points of concern about the future of U.S. economic competitiveness and living standards:

- Productivity has increased at modest rates since the start of the current business cycle in December 2007. The U.S. economy may already be losing some of its competitive edge in world markets as the U.S. high-tech trade deficit continues to worsen. Domestic innovators are facing stronger international competition as overseas patent applications grow faster than domestic ones.

- Business investment, while recovering, remains historically low. Corporations are not directing their rebounding profits to productivity-enhancing activities, instead holding cash or spending the money on buying back their own shares and paying out dividends to shareholders.
- Spending on innovation is decelerating, in particular public investments in science and research that in the past have led to revolutionary technological advances and private venture capital investments in early-stage start-up companies.
- Workforce training in science, technology, engineering, and mathematics is lagging, such that U.S. employers may not be able to hire all of the skilled workers that they will need in the future.

Productivity growth doesn't just fall from the sky; it requires sustained policy attention to create private incentives and to supply complementary public investments. One saving grace is the potential opportunity presented by the special congressional "super committee" tasked with presenting a plan for deficit reduction by Thanksgiving. Its 12 members—drawn equally from both parties and chambers of Congress—were given great leeway by Congress under the recently enacted Budget Control Act of 2011, including to recommend policies that can get the economy moving today. The committee can propose legislation that requires only a majority of votes in the House and Senate to boost employment, incomes, and investment while building the foundation for a more productive, competitive, and stable economy tomorrow. The 12 committee members and all members of Congress should seize this opportunity to focus public debate on real national economic priorities: growth, jobs, and competitiveness. Here's why.

The numbers tell the tale

Soft productivity growth requires policy attention

Worker productivity, the amount of goods or services produced in an hour of work, fell 0.3 percent in the second quarter of 2011. Though productivity in the U.S. economy is up 6.5 percent since the start of the Great Recession—and the current business cycle—in December 2007, the growth in productivity is lagging the pace of previous business cycles. There have only been two business cycles since the Great Depression that lasted at least as long as the Great Recession *and* had equal or lower productivity growth during this period. All other six such business cycles yielded faster productivity growth.

Productivity growth is soft in part due to slow economic growth but also because productivity growth tends to follow business investment with a lag of one or two decades. The present slow growth could bode ill for future productivity increases in the U.S. economy. Business investment in equipment, software, and factories, as we discuss next, has been at or near historic lows for a decade now. Low investment today may likely constrain productivity increases tomorrow.

Some business investment recovering

Since March 2010, business investment grew faster than gross domestic product or GDP—the sum total of all goods and services produced by workers and equipment in the United States. Business investment stood at less than 10 percent of GDP in the second quarter of 2011, and has averaged just 10.2 percent of GDP for the current business cycle—the lowest average of any business cycle since the late 1960s.

The American Recovery and Reinvestment Act of 2009 helped pave the way for the recovery and increase of business spending on equipment such as trucks, machinery, and computers. Such business investment fell to a low of 6.4 percent of GDP in the second quarter of 2009. As the Recovery Act stimulus began kicking in, the demand it propelled for investment goods from private businesses helped boost equipment spending to 7.3 percent of GDP in the second quarter of 2011. While business equipment investment has nearly recovered to prerecession levels, business investment in buildings and factories remains nearly 33 percent below prerecession levels in the wake of the real estate bubble and mortgage and financial crisis.

Business investment, though on the upswing, will only gain momentum if businesses expect more sales in the future. Additional sales can come from stronger consumption at home and from more exports.

Rebounding profits fuel cash holdings, share repurchases—not productive activity

The slow recovery of business investment has little to do with business profitability. The corporate profit rate in nonfinancial businesses is up from a low of 1.5 percent of total assets in December 2008 to 2.8 percent in March 2011, the highest level since December 2006. But with these profits, corporations are prioritizing activities other than hiring and investing. First, corporations are stockpiling cash holdings, which stood at 6.8 percent of total assets in March 2011, the highest level since December 1965.

Second, corporations are using rebounding profits to prop up their stock prices—a key factor in executive compensation—by repurchasing shares and paying out dividends amounting to 118 percent of after-tax profits on average between December 2007 and March 2011. This means corporations are actually borrowing money to buy back their own shares and pay dividends, rather than putting that money into productivity-enhancing investments or hiring workers.

Venture capital investment neglecting early innovation

Investments by venture capital investors are also recovering slowly. In the four quarters through June 2011, venture capital investments amounted to more than \$24.9 billion, up 5 percent over one year prior, but still 21 percent lower than before the financial turmoil in the second half of 2008—and less than one-fourth of the level at the end of the 1990s dot-com era, after adjusting for inflation.

The slow recovery of VC funding reflects less a lack of opportunities or resources and more a lack of risk appetite from VC investors. Financing for expansion and late-stage VC investments has grown at a robust 19 percent annual rate since the start of the current business cycle. Over the same time VC investments in seed-stage companies have fallen by 34 percent. In an environment of low overall investment and employment, creating uncertainty for economic growth, venture capitalists are seeking more proven investments over riskier start-up businesses and innovations.

The United States lags behind other countries in R&D spending

Spending on research and development in the United States amounted to 2.7 percent of GDP in 2007 (the most recent year of comparable data), ranking eighth in the world. Israel, Sweden, South Korea, Finland, Japan, Switzerland, and Iceland all dedicated larger shares of their economies to R&D investment. China, in comparison, dedicated 1.5 percent of its GDP to R&D and ranked 24th among all countries.

R&D figures include both private business and public investments in research and innovation. Though total R&D spending is led by private business—accounting for an average of two-thirds of all R&D—not all private-sector R&D investment yields improvements to productivity or general social well-being in obvious ways. A food manufacturer, for example, may spend on R&D leading to a new artificial flavoring. In contrast, public investments in R&D typically provide support for development of basic science, technological advances, and commercialization of innovations. Often, such public R&D spending provides resources critical for supporting activities of private businesses. But Federal government spending on R&D has lagged far behind private R&D, growing at only 1.5 percent annually through 2008 and has been targeted for severe cuts in recent budget negotiations.

STEM workforce in relative decline

All the capital in the world can't be productive but for a skilled labor force to put it to work. Of course innovative ideas may come from anywhere, but training in science, technology, engineering, and mathematics—so-called STEM fields—creates a workforce with the requisite skills to be productive at innovating, adapting, and implementing new

technological advances. Over the past decade educational attainment in the U.S. labor force increased steadily, with the share of the labor force earning associate degrees rising from 9 percent in 2000 to more than 10 percent in 2009, and with the share earning four-year college degrees rising from 20 to 22 percent.

Educational attainment is on the rise, yet students are increasingly moving away from education in STEM fields. In 2003, as much as 18 percent of all associate degree recipients earned degrees in STEM fields, but by 2009 only 11 percent did. Similarly, early in the decade 4.3 percent of all bachelor degree recipients were in STEM fields, but by 2009 only 3.8 percent graduated with STEM majors. The declining shares of workers graduating with STEM skills could impede adaptation and commercialization of innovations and technology into new business applications, even though [U.S. universities continue graduating high shares of STEM Ph.D.s](#).

Advanced technology trade balance eroding further

The U.S. trade deficit in high-tech goods, such as aircraft, optical equipment, and medical devices, worsened 45 percent to \$92 billion in the 12 months through June 2011, the last month for which we have data. For the past two years, U.S. exports of advanced technology goods have grown at a modest 2.7 percent annually. At the same time, U.S. high-tech imports—already larger than exports to begin with—grew 9.4 percent annually to \$384 billion. On an annualized basis, the high-tech trade deficit now has worsened every month for the past 20 months.

Compared to other U.S. exports, high-tech exports are growing slowly. Overall U.S. exports grew 11.5 percent annually for the past two years. Lagging performance of advanced technology trade also weighs on the overall U.S. trade deficit. The share of the high-tech trade deficit in the total U.S. trade deficit increased from 11.8 percent one year ago to 13.6 percent in June.

The U.S. economy may be losing its competitive edge as the trade balance in high-tech products is widening, and a widening high-tech trade deficit contributes to a growing threat of economic instability emanating from a rapidly growing overall U.S. trade deficit.

Domestic innovation facing stronger international competition

Grants for utility patents from the U.S. Patent and Trademark Office grew markedly in 2010, up 31 percent over 2009 to nearly 220,000 grants. Utility patents are special property rights awarded to individuals or organizations for the invention of “new and useful” or material improvements of processes, machines, or materials. Not all patents represent productivity-enhancing innovation and the timing of patent grants may not coincide with the timing of invention. Nonetheless, the pace of patent awards provides a metric of the pace of innovation in the U.S. economy.

Even though patents overall were up in 2010, the share of patents awarded to domestic U.S. entities continued to decline. Under U.S. law, both Americans and foreigners can apply for patent rights. Of new patent awards in 2010, 51 percent were granted to foreign entities; in 1999 foreign entities earned only 45 percent of all patent awards.

Innovations from abroad can still confer substantial benefits on the U.S. economy. By making new technologies or practices available to domestic businesses and consumers, foreign innovations can enhance business productivity and boost living standards for U.S. households. But homegrown innovation remains critical to U.S. global science and technology leadership, and the rising awards of patents to foreigners signals an increasingly competitive international landscape for innovation.

Conclusion

With the broad authority vested in the congressional “super committee” under the Budget Control Act, lawmakers now have an opportunity to act on flagging U.S. productivity. At the very least, any deal should refrain from cutting fiscal support from an already fragile economy. Beyond this very low bar, Congress has an opportunity to refocus public debate on real national economic priorities—strong and sustained economic growth, jobs, and productivity. Here, there are two obvious and mutually reinforcing policy imperatives:

- Shore up the fragile economic recovery and boost employment by stabilizing aggregate demand growth, which will strengthen the private sector’s sales expectations that are key to increasing business investment.
- Support for public investments in education, infrastructure, and scientific research that provide a foundation for innovation and productivity across all sectors of the U.S. economy.

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