

Looking for Jobs? Look to IT in 2012 and Beyond

BY LUKE A. STEWART AND ROBERT D. ATKINSON | AUGUST 2012

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Jobs, jobs, jobs! This is the mantra in Washington these days—and, with unemployment over eight percent, rightly so.¹ But, while it makes sense for policymakers to look to new industries such as clean energy to power job creation, they often overlook the key role that information technology (IT) has played and will continue to play in job creation throughout all industries. In fact, over the last decade, IT employment in the United States grew rapidly. According to the Bureau of Labor Statistics, between 2001 and 2011, over 565,000 new IT jobs were created, an increase of 22.2 percent. Indeed, employment in IT occupations in all industries grew more than 95 times faster than employment as a whole, which grew by only 0.2 percent.² (Figure 1) And because of the growth in these high-paying jobs, GDP is over \$89 billion larger in 2011 than it was in 2001.³

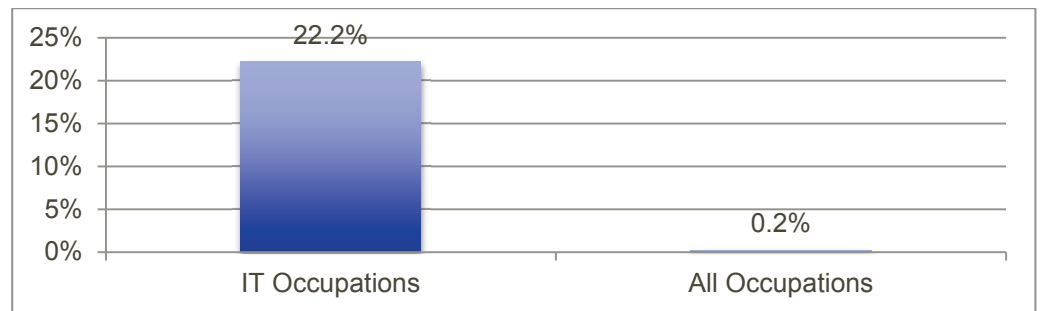


Figure 1: Growth in IT Occupation Employment vs. Employment in All Occupations, 2001-2011⁴

Furthermore, over the course of the Great Recession IT jobs have grown much faster than non-IT jobs. Between May 2007 and May 2011, while U.S. jobs shrank by -4.5 percent, IT jobs grew by 6.8 percent, contributing \$37 billion to an economy that was otherwise

stagnant.⁵ (Figure 2) Even through the recession, the growth of these IT jobs has helped a growing number of families enjoy greater financial security. In 2011, IT workers earned \$78,584 a year, 74 percent more than the average worker (\$45,230). (Figure 3)⁶

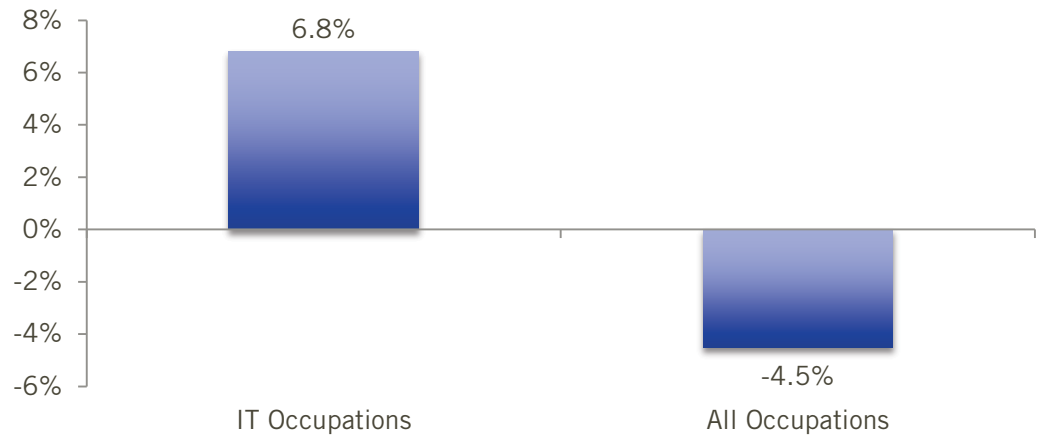


Figure 2: Growth in IT Occupation Employment vs. Employment in All Occupations Through the Great Recession and Subsequent Years, 2007-2011⁷

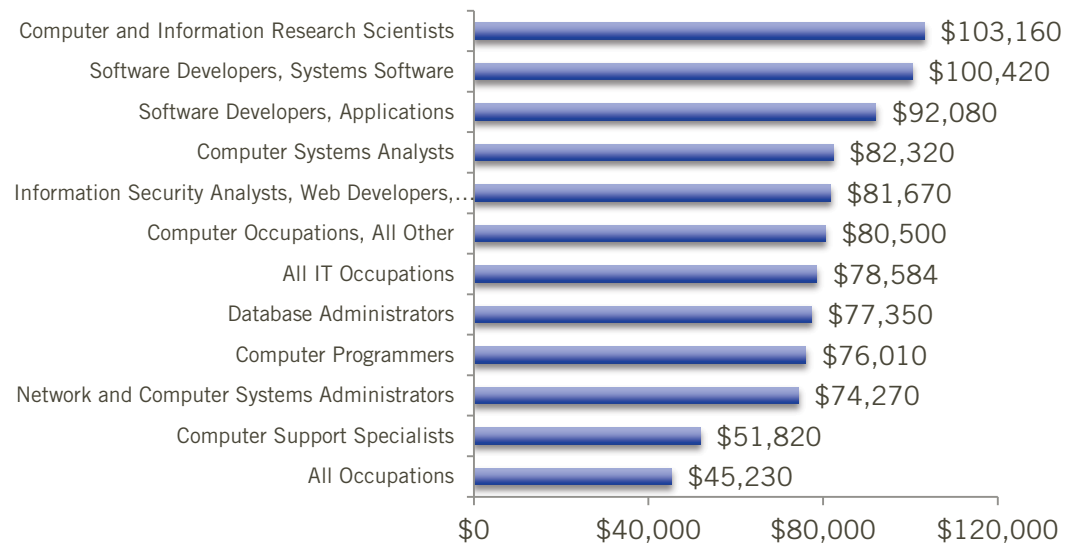


Figure 3: Average Annual Earnings, 2011⁸

This positive reality is at odds with the view of many pundits who argue that, since the bursting of the dot-com bubble in 2000 and the rise of offshoring, the IT jobs engine is sputtering. As Harvard Business School's Nicolas Carr put it in 2003, "As for information technology-spurred industry transformation, most of the ones that are going to happen have likely already happened or are in the process of happening."⁹ In other words, while IT might have been a jobs engine in the 1990s, its time has now passed. Meanwhile, other pundits point to the ever-increasing number of IT jobs moving offshore to lower-cost countries such as India and Eastern Europe.¹⁰ This is a story often repeated in the press: "company X has recently moved Y number of IT jobs to country Z."

There are two reasons why pessimists have gotten it wrong when it comes to IT offshoring. First, even though some IT jobs are moving offshore, many of those jobs involve routinized tasks that can utilize lower-skill labor. While computer programming jobs declined by approximately 180,000 jobs over the last decade—presumably much of it to due to offshoring—programming jobs in fact occupy the lower-value end of software production.¹¹ The higher-value end, occupied by software developers who design the underlying systems behind the software, requires higher-skill labor, and thus is harder to move to low-wage nations. Indeed, software developer jobs paid 22 percent more than the average IT job, 26 percent more than computer programmers, and grew by over 300,000 during this period, offsetting the loss by 120,000 additional jobs.¹² (Figures 4 and 5) Likewise, another high-skill occupation, computer systems analysts,¹³ pays 8 percent more than computer programming and grew by approximately 39,000 over the period.¹⁴ Second, for many kinds of IT jobs it is more valuable to have workers to be onsite or nearby. These jobs cannot be offshored, and thus network administrators and computer support specialists added roughly 114,000 and 139,000 jobs respectively over the last decade.¹⁵

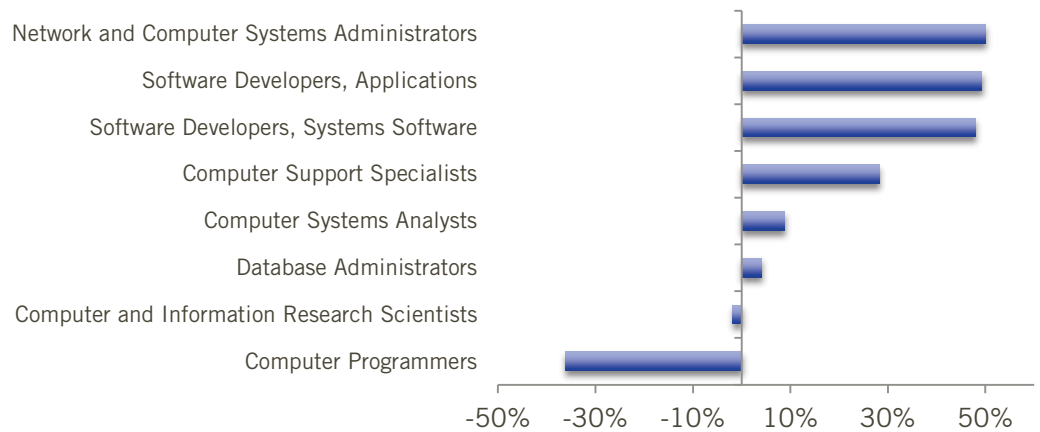


Figure 4: Approximate Percentage Change in Selected IT Occupation Jobs, 2001-2011¹⁶

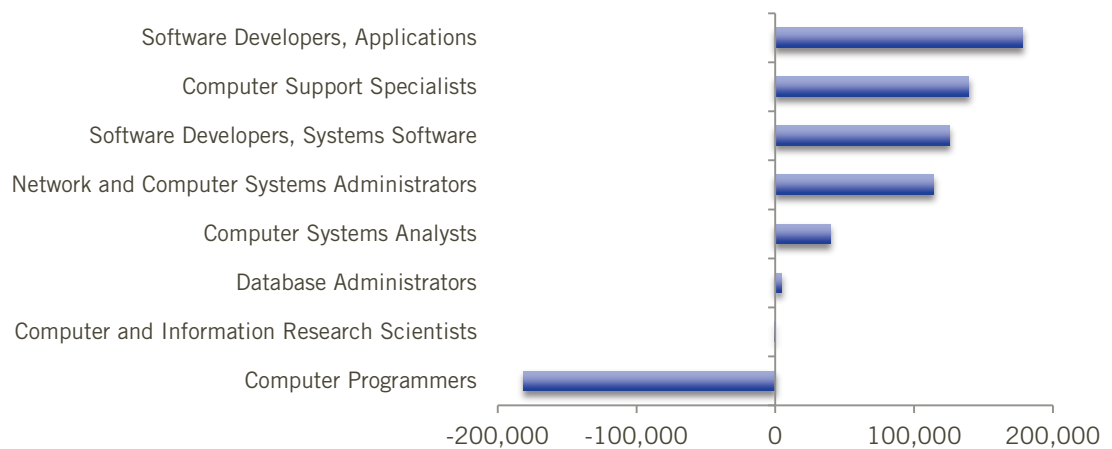


Figure 5: Approximate Level Change in Selected IT Occupation Jobs, 2001-2011¹⁷

While business investment in all forms of capital increased by only 13 percent between 2001 and 2011, investment in IT capital increased by 66 percent, over five times faster.

As we look to the future we can expect more—not less—potential for IT job growth, because the U.S. economy is growing ever more dependent on IT for innovation, productivity growth, and quality of life improvements. For example, while business investment in all forms of capital increased by only 13 percent between 2001 and 2011, investment in IT capital increased by 66 percent, over five times faster.¹⁸ (Figure 6) And, in contrast to Nick Carr’s pessimistic prognosis, IT innovation has continued at a rapid pace, powered by significant price declines and rapid performance improvements. New innovations are occurring regularly, from the expansion of high-speed broadband and cloud computing, to social networking technology and new kinds of mobile devices and apps. And we see more and more breakthrough innovations every year, as evidenced by examples such as the recent releases of Microsoft’s Kinect gesture-input device and Apple’s Siri natural-language processing technology. Indeed, a large portion of the fastest growing companies are IT-related. In the “2011 Inc. 5000” rankings of the 5000 fastest growing companies in the United States, over 1,140 are in the IT industry, with a three-year average growth rate of 302 percent and revenues totaling nearly 54 billion in 2011 alone.¹⁹ In Deloitte’s “2011 Technology Fast 500 Ranking,” a ranking of the fastest growing high-technology firms in the United States, 330 of the 500 companies are in the IT industry.²⁰ And an even greater number of these fast-growing companies—companies outside of the IT industry—employ IT workers. With the advent and expansion of new IT systems such as health IT, smart grids, intelligent transportation, the continued expansion of broadband, and the growth of e-commerce and e-government, the importance of IT jobs to the U.S. economy will only grow.

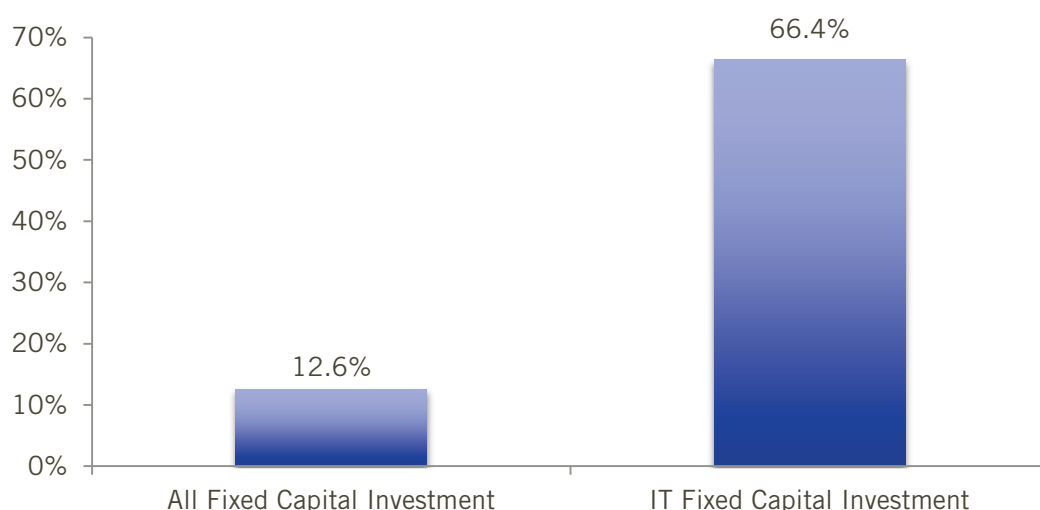


Figure 6: Percentage Change in Industry Fixed Investment by Type, 2001-2011²¹

Nevertheless, it would be a mistake for policymakers to think that simply because IT has been a jobs engine in the past, it will effortlessly continue to drive job growth in the future. Rather, in order to sustain the growth in IT jobs, policymakers must actively address both the supply side and demand side of the IT market.

On the supply side, policymakers must ensure that training and education programs effectively enhance Americans’ IT skills. Even as these high-paying IT jobs continue to

expand, too few students are learning IT. For example, so few students were taking the second-level advanced placement (AP) computer science exam that the College Board (which administers the AP exams) was forced to discontinue the test in 2009.²² How does the U.S. expect to lead the IT economy if so few high school students are motivated to learn computer science? Among other strategies, policymakers must overhaul and expand computer science education, particularly at the high school level. One simple step would be for states to allow computer science courses to count toward the core requirements of math or science. Only ten states currently allow computer science courses (if they even exist) to fulfill a core math or science requirement. In the other forty states, students must find a way to fit computer science classes in to their curriculum as electives.²³ Additionally, policymakers need to ensure that needed foreign IT talent is able to easily enter and work in the United States.²⁴ Without a ready supply of both foreign and domestic talent, the pool from which the American IT industry draws its innovations, and from which non-IT other firm draw talent to build their IT infrastructure, will run dry.

On the demand side, the federal government and state and local governments need to implement and expand policies that spur the digital transformation of the economy. The 2008 American Recovery and Reinvestment Act's funding for health IT, broadband and smart grid were a move in the right direction. And the Obama Administration's *National Broadband Plan* lays out a strategy for expanding not only broadband, but also other key IT applications.²⁵ But as ITIF has shown, the United States lags in many IT areas, including health IT, smart grid, mobile commerce, intelligent transportation systems and electronic identification.²⁶ We need not only to develop plans, but also to fully fund and implement them.

Finally, while smart public policies can help expand the digital economy and the high-paying jobs that go with it, ill-suited public policies, such as overly stringent regulations and excessive taxes on broadband, privacy, and e-commerce can have the opposite effect, limiting investment and retarding job growth.²⁷ With effective policies that target both sides of the IT market, the United States will enjoy sustained leadership in the utilization of IT in all industries and the high-paying and fast-growing jobs that come with it. Without these policies, that leadership and those jobs are at risk.

ENDNOTES

1. Bureau of Labor Statistics, “Employment Situation Summary,” new release, July 6, 2012, <http://www.bls.gov/news.release/empstat.nr0.htm>.
2. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis. Occupations included in the IT jobs classification in 2011 are “Computer Systems Analysts,” “Computer Programmers,” “Software Developers, Applications,” “Software Developers, Systems Software,” “Database Administrators,” “Network and Computer Systems Administrators,” “Computer Support Specialists,” “Computer and Information Research Scientists,” “Information Security Analysts, Web Developers, and Computer Network Architects,” and “Computer Occupations, All Other.” Because the Bureau of Labor Statistics regularly reclassifies occupations as the economy evolves, there are differences in the IT jobs classification for 2001. Specifically, 2011’s “Information Security Analysts, Web Developers, and Computer Network Architects” occupations did not exist in 2001 and “Computer Occupations, All Other” was not counted in 2001. Additionally, 2001 included a “Network Systems and Data Communication Analysts” occupation that had been superseded by 2011.
3. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis. IT jobs’ contribution to GDP was calculated by subtracting the product of IT employment in 2001 and IT earnings in 2001 from the product of IT employment in 2011 and IT earnings in 2001. This assumes that these workers currently employed in IT would otherwise be unemployed.
4. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis.
5. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2007, May 2011); accessed July 18, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis. IT jobs’ contribution to GDP was calculated by subtracting the product of IT employment in 2007 and IT earnings in 2007 from the product of IT employment in 2011 and IT earnings in 2001. This assumes that these workers currently employed in IT would otherwise be unemployed.
6. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis. In reality, the difference between the average IT wage and the U.S. average wage is likely larger because of the way the Bureau of Labor Statistics (BLS) calculates annual employment. BLS surveys only hourly wages and then assumes all employees work 2,080 hours a year (40 hours a week, 52 weeks a year), which overvalues part time employment.
7. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis.
8. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis.
9. Nicholas G. Carr, “IT Doesn’t Matter,” *Harvard Business Review*, May 2003, <http://hbr.org/2003/05/it-doesnt-matter/ar/1>.
10. Patrick Thibodeau, “Can Obama reverse job offshoring?,” *ComputerWorld*, November 8, 2008, http://blogs.computerworld.com/can_obama_reverse_job_offshoring; Robert D. Atkinson, “Apocalypse Soon? Why Alan Blinder Gets It Wrong on Offshoring” (technical report, Information Technology and Innovation Foundation, July 6, 2006), <http://www.itif.org/files/blinder1final.pdf>.
11. “Computer programmers write code to create software programs. They turn the program designs created by software developers and engineers into instructions that a computer can follow.” See Bureau of Labor Statistics, “Computer Programmers,” in *Occupational Outlook Handbook* (Washington, D.C.: BLS, 2012), <http://www.bls.gov/ooh/computer-and-information-technology/computer-programmers.htm>.

12. “Software developers are the creative minds behind computer programs. Some develop the applications that allow people to do specific tasks on a computer or other device. Others develop the underlying systems that run the devices or control networks.” See Bureau of Labor Statistics, “Software Developers,” in Occupational Outlook Handbook (Washington, D.C.: BLS, 2012), <http://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm>.
13. “Computer systems analysts study an organization’s current computer systems and procedures and make recommendations to management to help the organization operate more efficiently and effectively. They bring business and information technology (IT) together by understanding the needs and limitations of both.” See Bureau of Labor Statistics, “Computer Systems Analysts,” in Occupational Outlook Handbook (Washington, D.C.: BLS, 2012), <http://www.bls.gov/ooh/computer-and-information-technology/computer-systems-analysts.htm>.
14. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. Authors’ analysis. Individual occupation analysis is an approximation, because the Bureau of Labor Statistics regularly reclassifies occupations as the economy evolves. Hence only occupations that retain the same or similar titles have been included in the individual occupation analysis. Nevertheless, due to definitional changes, there has been some reclassification of individual workers among the individual occupations between 2001 and 2011.
15. “Network and computer systems administrators are responsible for the day-to-day operation of an organization’s computer networks. They organize, install, and support an organization’s computer systems, including local area networks (LANs), wide area networks (WANs), network segments, intranets, and other data communication systems.” See Bureau of Labor Statistics, “Network and Computer Systems Administrators,” in Occupational Outlook Handbook (Washington, D.C.: BLS, 2012), <http://www.bls.gov/ooh/Computer-and-Information-Technology/Network-and-computer-systems-administrators.htm>; “Computer support specialists provide help and advice to people and organizations using computer software or equipment. Some, called technical support specialists, support information technology (IT) employees within their organization. Others, called help-desk technicians, assist non-IT users who are having computer problems.” See Bureau of Labor Statistics, “Computer Support Specialists,” in Occupational Outlook Handbook (Washington, D.C.: BLS, 2012), <http://www.bls.gov/ooh/computer-and-information-technology/computer-support-specialists.htm>.
16. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. The chart only shows “selected” occupations because the Bureau of Labor Statistics regularly reclassifies occupations as the economy evolves. Hence only occupations that retain the same or similar titles have been included in the individual occupation analysis. Nevertheless, due to definitional changes, there has been some reclassification of individual workers among the individual occupations between 2001 and 2011.
17. Bureau of Labor Statistics, Occupational Employment Statistics (occupational employment and wage estimates, national cross-industry estimates, May 2001, May 2011); accessed July 17, 2012), http://www.bls.gov/oes/oes_dl.htm. The chart only shows “selected” occupations because the Bureau of Labor Statistics regularly reclassifies occupations as the economy evolves. Hence only occupations that retain the same or similar titles have been included in the individual occupation analysis. Nevertheless, due to definitional changes, there has been some reclassification of individual workers among the individual occupations between 2001 and 2011.
18. Bureau of Economic Analysis, National Income and Product Accounts Tables (table 5.3.3, real private fixed investment by type, quantity indexes; accessed July 18, 2012), http://www.bea.gov/iTable/index_nipa.cfm. Authors’ analysis.
19. “2011 Inc. 5000,” Inc., 2011, <http://www.inc.com/inc5000/welcome>. IT industries are “Computer Hardware,” “IT Services,” “Software,” and “Telecommunications.”
20. “Deloitte’s 2011 Technology Fast 500 Ranking,” Deloitte, 2011, http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/TMT_us_tmt/us_tmt_2011%20Fast500%20Rank%20v2.pdf. IT industries are “Communications/Networking,” “Software,” “Internet,” and “Semiconductor.”

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21. Bureau of Economic Analysis, National Income and Product Accounts Tables (table 5.3.3, real private fixed investment by type, quantity indexes; accessed July 18, 2012), http://www.bea.gov/iTable/index_nipa.cfm. Authors' analysis.
 22. Scott J. Cech, "College Board Intends to Drop AP Programs in Four Subject," *Education Week*, April 4, 2009, <http://www.edweek.org/ew/articles/2008/04/09/32ap.h27.html>.
 23. Robert D. Atkinson and Merrilea Mayo, *Refueling the U.S. Innovation Economy: Fresh Approaches to Science, Technology, Engineering and Mathematics (STEM) Education* (Washington, D.C.: Information Technology and Innovation Foundation, 2010), <http://www.itif.org/files/2010-refueling-innovation-economy.pdf>.
 24. See Robert D. Atkinson, "H-1B Visa Workers: Lower Wage Substitute, or Higher-Wage Complement" (technical report, Information Technology and Innovation Foundation, June 9, 2010), <http://www.itif.org/files/2010-H1B-Visa.pdf>.
 25. See Federal Communications Commission, *Connecting America: The National Broadband Plan* (Washington, D.C.: FCC, 2010), <http://download.broadband.gov/plan/national-broadband-plan.pdf>.
 26. See Stephen Ezell, *Explaining International IT Application Leadership: Intelligent Transportation Systems* (Washington, D.C.: Information Technology and Innovation Foundation, 2010), http://www.itif.org/files/2010-1-27-ITS_Leadership.pdf; Stephen Ezell, *Explaining International IT Application Leadership: Contactless Mobile Payments* (Washington, D.C.: Information Technology and Innovation Foundation, 2009), <http://www.itif.org/files/2009-Mobile-Payments.pdf>; Daniel Castro, *Explaining International IT Application Leadership: Health IT* (Washington, D.C.: Information Technology and Innovation Foundation, 2009), <http://www.itif.org/files/2009-leadership-healthit.pdf>; Daniel Castro, *Explaining International IT Application Leadership: Electronic Identification Systems* (Washington, D.C.: Information Technology and Innovation Foundation, 2011), <http://www.itif.org/files/2011-e-id-report-final.pdf>; Robert D. Atkinson, Daniel Castro and Stephen J. Ezell, "The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America" (technical report, Information Technology and Innovation Foundation, January 2009), <http://www.itif.org/files/roadtorecovery.pdf>.
 27. See Digital Goods and Services Act of 2011: Hearing on H.R. 1860, Before the Subcommittee on Courts, Commercial and Administrative Law, Committee on the Judiciary, U.S. House of Representatives, 113th Cong. (May 23, 2011) (statement of Robert D. Atkinson, President and Founder, Information Technology and Innovation Foundation), <http://www.itif.org/files/2011-Atkinson-Testimony-DigitalGoods.pdf>; Hearing on "Do-Not-Track Legislation: Is Now the Right Time?," Before the Subcommittee on Commerce, Trade, and Consumer Protection, Committee on Energy and Commerce, 111th Cong. (December 2, 2010) (statement of Daniel D. Castro, Senior Analyst, Information Technology and Innovation Foundation), <http://www.itif.org/files/2010-do-not-track-testimony.pdf>.

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ABOUT ITIF

The Information Technology and Innovation Foundation (ITIF) is a Washington, D.C.-based think tank at the cutting edge of designing innovation strategies and technology policies to create economic opportunities and improve quality of life in the United States and around the world. Founded in 2006, ITIF is a 501(c) 3 nonprofit, non-partisan organization that documents the beneficial role technology plays in our lives and provides pragmatic ideas for improving technology-driven productivity, boosting competitiveness, and meeting today's global challenges through innovation.

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