The Abe Government Grapples with Low IT Investment

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Since returning to power in December 2012, Japanese Prime Minister Shinzo Abe has struggled to advance the so-called "third arrow" of Abenomics, which includes both structural reforms to transform the Japanese economy and an industrial policy that uses state power to foster new industries. Perhaps the tip of that arrow – and a key to its advancement – is information technology (IT) policy. In fact, as Abe's meetings with Silicon Valley during his May 2015 trip to the United States suggest, IT is increasingly critical to his government's economic vision.

IT policy has played an important role since the beginning of the administration. Starting with its June 2013 "Declaration to be the World's Most Advanced IT Nation," the Abe government has indicated that IT is one of the keys to realizing Abenomics' goal of sustainable growth over the long term. As the declaration says:

> Information technology (IT) has the power to spur innovation as an all-purpose tool that can be used in all fields. IT can lead to higher productivity in service industries, which is relatively low despite accounting for approximately 70% of Japan's GDP, and contribute to higher productivity as a foundation for growth potential.[1]

Greater IT investment in the service industry may well determine whether the Japanese economy overcomes stagnation over the next 15-20 years. As a recent report by the McKinsey Global Institute suggests: "If Japan can successfully double its rate of productivity growth, it could boost annual GDP growth to approximately 3 percent. By 2025, this would increase Japan's GDP by up to 30 percent over the current trajectory."[2]

To unlock these productivity gains, IT must also factor prominently in labor-market reform, which encourages employers to invest in labor-saving technologies, and education reform, which provides young workers with the skills to compete in more flexible labor markets.

Despite rhetoric about the importance of IT, however, the government has been slow to articulate the necessary regulatory reforms. Similarly, while the Abe government has voiced its support for a stronger domestic IT industry and a more vibrant start-up culture –in 2015 the government awarded the first annual "Japan Venture Prize"[3] – it faces an uphill battle to encourage entrepreneurship in the IT-producing sector, not least because low levels of investment in IT-using sectors depresses demand for new hardware and software.

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[1] IT Comprehensive Strategy Headquarters. Cabinet Secretariat, "Declaration to be the World's Most Advanced IT Nation," 14 June 2013. <http://www.kantei.go.jp/jp/singi/it2/kettei/pdf/20130614/siryou5.pdf>.
[2] McKinsey Global Institute, *The Future of Japan: Reigniting Productivity and Growth*, March 2015.
[3] Prime Minister's Office, "Japan Venture Prize Awards Ceremony," 22 January 2015. <http://www.kantei.go.jp/jp/97_abe/actions/201501/22venture.html>.

The Abe government clearly recognizes that it must do more to create an environment in which the service sector can invest in productivity-enhancing technology. In fact, this issue is expected to be central to the government's 2015 growth strategy, which will be issued in June.

Japan as an IT Laggard?

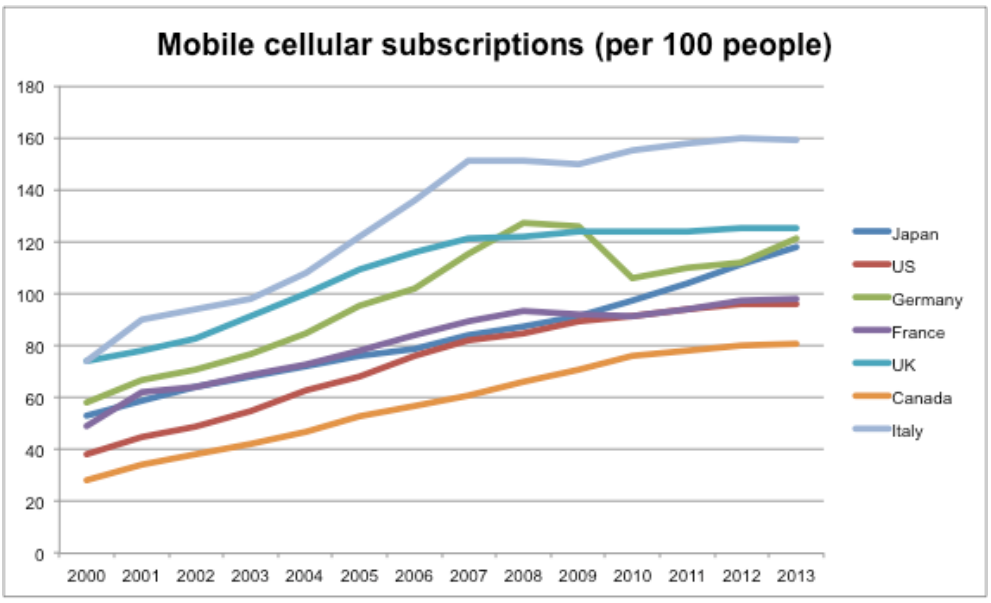
From the beginning, Japan's IT policy has been driven by a recognition that the country is falling behind its G7 peers (and its neighbor South Korea) in its embrace of the information age.

Japan's failure to keep pace resulted, in part, because the government was slow to recognize IT as a priority. It was not until Yoshiro Mori became prime minister in 2000 that IT policy became a top priority. In his policy speech opening the 2000 extraordinary Diet session, Mori pledged to implement an "e-Japan Plan" that would establish a framework for bringing the IT revolution to Japan.[4] In July 2000, the Mori government established the Information Technology Strategy Headquarters in recognition of the "revolutionary" impact IT would have on business and society. Drawing upon private-sector expertise, the headquarters and its strategy council were tasked with drafting an IT strategy and basic law that would identify concrete steps towards creating a "Japan-style IT society."

The strategy, published in November 2000, acknowledged that Japan had "fallen behind" its peer competitors in grappling with the implications of the IT revolution. The strategy blamed high costs and onerous regulations for impeding the rapid diffusion of the Internet in Japanese society. In order to catch up with the United States and other countries, the strategy recommended: (1) boosting public and private investment in widespread, low-cost, high-speed Internet access; (2) lifting restrictions on e-commerce; (3) hastening the advance of e-government and (4) promoting the use of IT in education to foster skilled IT professionals.[5] These recommendations were included in the IT Basic Law, which the Diet passed on November 29, 2000.

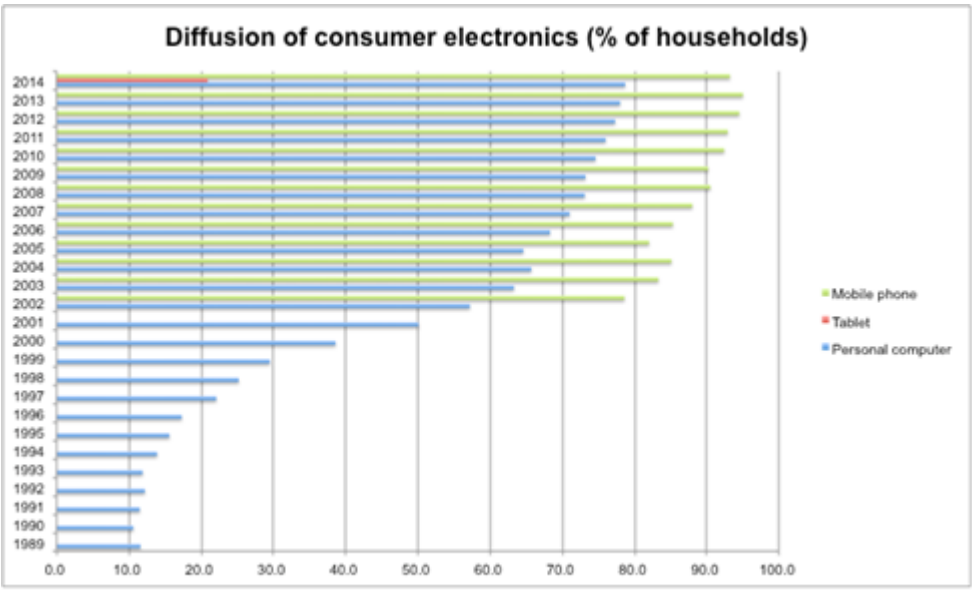
Arguably, the e-Japan program – which continued until the end of the Koizumi government in 2006 – achieved its primary goal of ensuring that Japan had the necessary infrastructure to provide widespread and affordable high-speed Internet access to the Japanese public.

[4] Prime Minister Yoshiro Mori, Policy Speech to the 150th session of the Diet, September 21, 2000. <http://www.kantei.go.jp/jp/morisouri/mori_speech/2000/0921jpg_syosin.html>.
[5] IT Strategy Council, Cabinet Secretariat, "IT Basic Strategy," November 27, 2000. <http://www.kantei.go.jp/jp/it/goudoukaigi/dai6/6siryou2.html>.

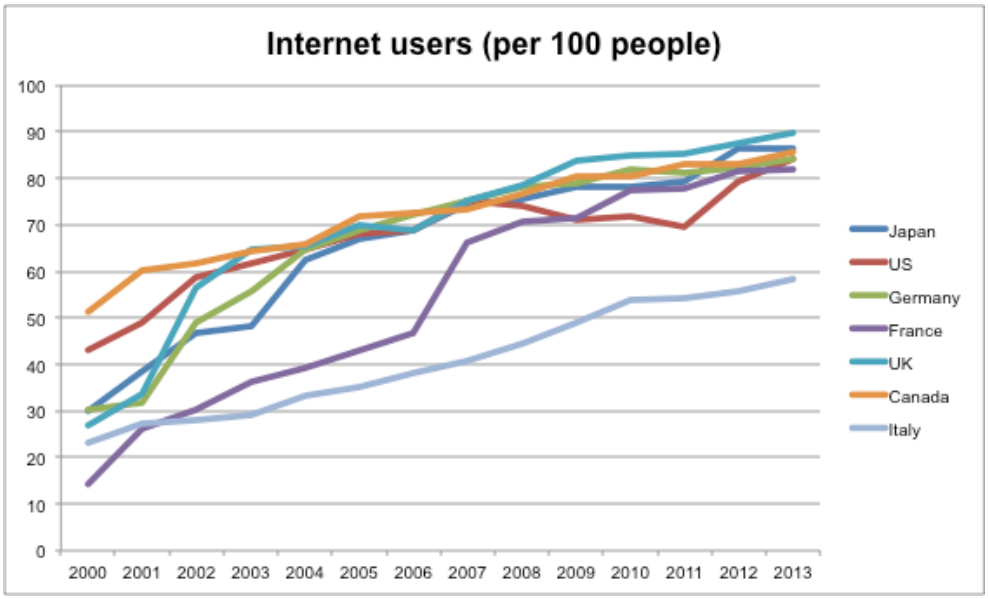


Source: World Bank

When it comes to basic measurements of IT infrastructure – number of mobile phone and Internet users, for example – Japan is at least as technologically advanced, if not more so, than other G7 countries (see figures 1, 2, and 3 below). Japan has seen the rapid diffusion of both Internet usage and mobile telephony. Although smartphone penetration may be lower than in other countries – estimates suggest that 75% of U.S. mobile subscribers used smartphones by the end of 2014 – the Cabinet Office's survey of household purchases of consumer durables suggests that, as of March 2014, of the 93.2% of households with mobile phones, 54.7% had smartphones.



Source: Cabinet Office, Japan



Source: World Bank

Meanwhile, thanks to policies undertaken by earlier governments and investments by the private sector, Japan enjoys among the highest quality Internet service in the world. According to the *State of the Internet Report,* published by Akamai, a cloud computing services provider, as of Q4 2014 Japan's average connection speed was 15.2 Mbps, a 16% gain year-on-year and the third-fastest average connection speed in the world. Although South Korea ranked number one, Japan was the only G7 country in the top ten. Similarly, Japan ranked fourth in the world for high broadband connectivity (the share of users with connection speeds greater than 10 Mbps), with 56% of users, and tenth in the world for broadband connectivity (share of users with connection speeds greater than 4 Mbps). Japan's mobile connectivity ranked similarly high: average speeds of 8.3 Mbps, with 81% of users enjoying connection speeds above 4 Mbps, placing Japan among the top five in the world.[6] These metrics suggest that, when it comes to IT infrastructure, Japan is highly competitive.

Where Japan has lagged is in integrating IT into business activities. There is some debate over the degree to which IT investment has contributed to productivity and growth in advanced industrial economies. Northwestern University's Robert Gordon has asserted, for example, that the most significant productivity gains from IT took place decades ago and that recent developments have added little in the way of productivity.[7] Others have argued that IT, like electricity, is a "general purpose technology," notable for its ability to enhance productivity and

[6] David Belson, *Akamai's State of the Internet Report*, Q4 2014.
[7] Robert Gordon, "Is U.S. economic growth over? Faltering innovation confronts the six headwinds," Policy Insight No. 63, Centre for Economic Policy Research, September 2012. <http://www.cepr.org/sites/default/files/policy_insights/PolicyInsight63.pdf>.

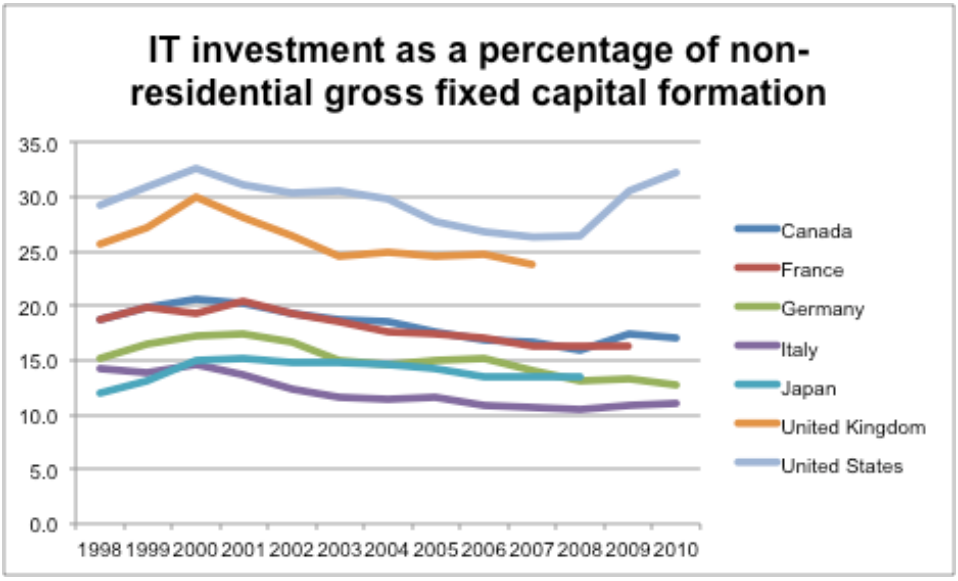
reshape business organizations across sectors, though there may be a lag before the productivity gains from IT investment are realized in IT-using sectors.[8]

Despite differing views on how IT impacts productivity, the impact of automation on labor in developed economies suggests that IT investment, whether in increasingly sophisticated computers, industrial robots, mobile communications technology, cloud computing or other software packages, enables firms to produce just as much or more with fewer workers. This impact can be seen in manufacturing and increasingly in transportation, retail and other service sector jobs. Whether by replacing a grocery store checkout line with self-service checkout, replacing a brick-and-mortar storefront with a website, replacing bank counters with automated teller machines or using "Big Data" to gather information about customers, IT has the potential to disrupt traditional patterns of employment, transform relations between employers and employees and upend industries across the economy, albeit not always for the better.[9]

Given the disruptive potential of IT investment, it is perhaps not surprising that, despite Japan's impressive IT infrastructure, many firms have been slow adopters. For example, Organisation for Economic Co-operation and Development (OECD) data suggests that, between the years 1998 and 2008, Japan's IT investment as a share of non-residential gross fixed capital formation was near the bottom of the G7 countries and substantially below the United States (see figure 4 below). More recent data collected by METI suggests that IT investment has remained sluggish in the years following the 2008 global financial crisis. For example, Japan's Ministry of Economy, Trade and Industry's (METI) FY2013 survey of company IT usage – which collected information from more than 5,000 firms – showed that the average company spent ¥592.5 million on IT in FY2012, a 4.8% drop from the previous fiscal year.

[8] Boyan Jovanovic, "General Purpose Technologies," NBER Working Paper Series #11093, National Bureau of Economic Research, January 2005. <http://www.nber.org/papers/w11093.pdf>. See also "IT was fun while IT lasted," *The Economist*, 7 July 2014. <http://www.economist.com/blogs/freeexchange/2014/07/productivity>.

[9] As Robert Litan notes, "In recent years, hugely profitable start-ups have created relatively few new jobs and done little to spread the wealth… If the majority of new companies resemble these successful technology firms, then any start-up renaissance will only magnify inequality. In addition, innovations in automation, robotics and data processing could eliminate millions of jobs in the coming decades, pushing many workers into lower-wage positions or out of the labor force altogether." See "Start-Up Slowdown," *Foreign Affairs* (January/February 2015).



Source: OECD

While lower IT expenditures may, to some extent, reflect falling prices, other findings suggest falling IT expenditures also reflect sluggish demand. For example, gains in IT expenditures are concentrated among firms with at least ¥100 billion in capital. Indeed, the average amount of annual expenditures on IT by firms with ¥1 billion or less in capital (the vast majority of firms) has been flat for almost a decade. In addition, METI found that average gains or cuts in IT expenditures closely tracked the average company's expected revenues, suggesting that firms were quick to cut IT spending when it appeared that bad times were ahead. Moreover, based on an examination of "stages" in IT adoption,[10] roughly 90% of firms with capitalization between ¥100 million and ¥1billion failed to progress beyond either the first or second of four stages of IT usage, and 50% of firms with capitalization of less than ¥100 million failed to progress beyond the first stage, in which IT usage is haphazard at best.[11] Finally, IT expenditures were concentrated disproportionately in the financial sector, where the average firm spent ¥6.4 billion on IT in FY2013, well ahead of the second-place transportation sector with average firm expenditures on IT of ¥1.5 billion.[12]

[10] METI evaluates IT adoption by determining how far IT adoption has advanced in six areas: degree of penetration, a standardized and stable foundation for IT, new business models to promote IT usage, IT management systems, a framework for evaluating IT investment, and fostering human capital for IT. In each area, the first stage means that IT usage is low or non-existent and is not well integrated within the business. In the second stage, businesses have begun to be more systematic in integrating IT, but more work needs to be done. In the third stage, IT is fully integrated into the business, managers are capable of assessing IT investment and both workers and managers are being trained in how to use IT. In the fourth stage, companies work with suppliers and other companies in the same industry to promote IT usage, and managers and employees are trained in how to use data analytics to improve productivity and boost revenues.

[11] METI, *Heisei-25 nendo wagakuni jyouhou keizai shakai ni okeru kiban seibi*, May 2014. <http://www.meti.go.jp/statistics/zyo/zyouhou/result-2/pdf/H25_report.pdf>.

[12] According to FY2012 Economic Census, financial-sector firms – including insurance companies – were around 0.78% of the total number of Japanese firms, and employed 2.84% of the workforce.

A survey conducted in November and December of 2012 for METI's Small and Medium Enterprise Agency shows that businesses – especially small businesses – not only have not invested in IT but also had no plans to do so or were unaware of new technologies.[13]

For instance:

- 82.1% of small businesses, 83.7% of medium-sized businesses and 70.8% of large businesses had no plans to use online auctions or e-retail sites, like Rakuten.
- 74.1% of small businesses, 70.1% of medium-sized businesses and 59.3% of large businesses had no plans to set up their own sites to sell products or take reservations.
- Among small businesses, when asked about their awareness of cloud computing, 30% said they knew nothing and 18.1% said they did not understand the question.
- 78% of all companies said they did not use and had no plans to use cloud computing.
- Nearly 80% of small businesses said they had no plans to introduce productivity-enhancing IT or did not see it as appropriate for their business.

Throughout the survey, small businesses were consistently less interested in adopting IT, suggesting that promoting IT as a means of enhancing productivity in the service sector will be a significant challenge for the Abe government. To some extent, the problem is education: when companies of all sizes that had not adopted IT were asked why, the most common answer (54.7%) was that they did not understand the effects IT would have and would not be able to evaluate it. Price is an issue too. More than 44% of all non-adopters said they could not bear the cost of IT investment. Other reasons for low levels of IT investment, as suggested by Hitotsubashi University economics professor Kyoji Fukao and others, include offshoring by Japanese manufacturers; the small size of firms in the service sector; low levels of entry by new firms; and the rise of temporary workers, which has depressed labor costs and discouraged firms from making investments in IT skill development.

Reluctance to invest in IT may help explain the struggles facing Japan's indigenous IT industry. Japanese companies have labored to keep pace with competitors in other developed countries as IT has shifted from hardware to software and Software as a Service (SaaS) has emerged.[14] With relatively little domestic demand compared to other countries, Japanese companies are largely absent from the global software industry. According to the PwC Global 100 Software Leaders list, compiled by the PricewaterhouseCoopers Technology Institute, as of 2011, only four Japanese companies ranked among the top 100 global software companies in terms of revenue. And that figure actually overstates Japan's presence in the global industry: of those four, only one (Trend Micro, ranked #32) received at least 10% of its total revenues from software. The other three – Fujitsu (#12), Hitachi (#20), and NEC (#26) – received only 6%, 2%, and 4%, respectively, of total revenues from software.[15]

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[13] Small and Medium Enterprise Agency, METI, *Heisei-24 nendo chushokigyo no keiei kadai ni kan suru chosa*, March 2013. <http://www.meti.go.jp/meti_lib/report/2013fy/E002798.pdf>.

[14] SaaS is perhaps the most prominent example of cloud computing and refers to the process by which companies license software to users, who access the software via web browser.

[15] PwC Technology Institute, "PwC Global 100 Software Leaders," May 2013. <http://www.pwc.com/en_US/us/technology/publications/assets/pwc-global-software-100.pdf>.

Underlying the relative absence of Japanese software firms from among the world's leaders are comparatively low rates of entrepreneurial activity.[16] According to the Global Entrepreneurship Monitor (GEM), an ongoing study of cross-national entrepreneurship founded by Babson College and the London Business School, in 2014 Japan's total early-stage entrepreneurial activity rate was 3.83%, the lowest in the G7. By comparison, the rate in the United States was 13.81%, the highest in the G7.[17] Moreover, GEM found that Japan lagged its G7 peers on attitudes regarding entrepreneurship. Among Japanese respondents, age 18-64:

- Only 2.52% of Japanese aged 18-64 said they intended to start a business within three years, the lowest rate in the G7 (although substantially higher than the 0.7% of Japanese who answered affirmatively in 2004).
- Only 30.98% of Japanese aged 18-64 said starting a new business was a "desirable career choice," the lowest rate by far in the G7 (in Germany, the second-lowest, the figure was 51.66%).
- Only 55.81% of Japanese aged 18-64 agreed with the statement that successful entrepreneurs are accorded high status, also the lowest rate by far in the G7.
- Only 7.27% of Japanese aged 18-64 saw good opportunities to start new businesses, again the lowest rate in the G7 by far.[18]

Given low levels of domestic adoption of IT and interest in entrepreneurial activity, it is not surprising that Japanese firms are lagging in the global software industry. Moreover, Japan's entrepreneurship data, when combined with data showing a lack of knowledge and interest in IT on the part of many Japanese businesses, suggests that Japan may face a vicious cycle when it comes to encouraging the use of IT and the growth of a robust IT sector.

The upshot of the reluctance of Japanese businesses to embrace IT is that Japan has trailed the United States in total factor productivity (TFP) growth – a measure of the impact of investments in new technology – in both the manufacturing and the service sectors.[19] Although in the past the United States has been an outlier in its ability to use IT investment to raise productivity and has seen TFP growth slow in recent years, the prospect of a shrinking workforce means that Japan is particularly dependent on boosting productivity.

Yet, encouraging firms to adopt IT and individuals to start new firms cannot be solved simply through public investment. Unlike Japan's IT policy at the start of the 2000s, which focused above all else on developing infrastructure, IT policy now must address the supply side

[16] The software industry is particularly amenable to startups since it is comparatively easy to create a product or platform that serves a large number of people with a small number of workers and low startup costs. See Marc Andreesen, "Why Software Is Eating The World," *Wall Street Journal*, 20 August 2011. <http://www.wsj.com/articles/SB10001424053111903480904576512250915629460>.
[17] Total early-stage entrepreneurial activity measures the percentage of the 18-64 population who are either nascent entrepreneurs, defined as the owner-managers of businesses less than three months old, or new business owners, defined as owner-managers of businesses between three months and forty-two months old.
[18] GEM data can be viewed at the Global Entrepreneurship Monitor Consortium. <http://www.gemconsortium.org/visualizations>. Accessed 8 May 2015.
[19] Kyoji Fukao, "Service Sector Productivity in Japan: The key to future economic growth," Research Institute of Economy, Trade, and Industry (RIETI), RIETI Policy Discussion paper Series 10-P-007, August 2010. <http://www.rieti.go.jp/jp/publications/pdp/10p007.pdf>.

obstacles preventing firms from investing in productivity-enhancing technology. In short, IT policy must also encompass labor market policy, education policy, industrial policy, and tax policy.

IT under Abe

Rhetorically, the Abe government recognizes the enormous challenge it faces in trying to promote greater IT investment and encourage the domestic IT industry – but also recognizes that a stronger embrace of IT is necessary for Japan's economic future. Accordingly, the Abe government's June 2013 "Declaration to be the World's Most Advanced IT Nation" acknowledged that promoting the widespread use of IT was essential to realizing sustainable growth over the long term.

Released the same day as the Abe government's first growth strategy, which covered the "third arrow" of Abenomics, the declaration signaled that the government not only recognized that IT investment was imperative for raising labor productivity but also that previous governments had not gone far enough to encourage investment. Pointing to the strategy articulated in 2000 by the Mori government, the declaration noted, "The original strategy emphasized use of IT, but simply espousing the adoption and use of IT without an adequate understanding of user needs or undertaking business process reforms that go beyond organizational boundaries did not allow for IT to exhibit its full benefits and efficiency." It criticized the failure of previous governments to overcome the tendency of Japan's ministries to duplicate efforts and stressed the need for central coordination in the prime minister's office.

To this end, the Abe government created the new post of Chief Information Officer (CIO) to oversee a five-year program to promote IT investment as outlined in the declaration. The three major goals were (1) promoting the creation of new industries; (2) encouraging the use of IT to manage health care, disaster preparedness, transportation and energy issues and (3) embracing the use of IT to simplify access to public services.

However, like much of the Abe government's "third arrow" policies, the proposals failed to measure up to the declaration's lofty ambitions. Regarding the first goal – perhaps the most important for raising productivity over the longer term – the government declared its intention to promote the use of "Big Data" by the private sector, partly through making public data available, encouraging the use of IT by agricultural producers and supporting the creation of new ventures engaged in "open innovation." The metrics by which these policies would be judged, however, were loosely defined. Moreover, in its self-assessment of progress towards implementing these programs, the government awarded itself high marks largely for administrative achievements (steps by ministries to establish supervisory bodies, for example) rather than for tangible progress towards the goal.[20] The declaration's goals for fostering expertise in IT, essential for the sector's development, were similarly vague, which a subsequent document – the December 2013 "Strategy for Developing Human Resources with Creative IT Skills" – did little to clarify.

[20] The Abe government created an "IT Dashboard" to track the progress of the IT declaration. <http://www.itdashboard.go.jp/en/Achievement/index#100>.

What is missing from the government's agenda is what the declaration recognizes is the ultimate goal of IT investment in the first place: boosting productivity in the service sector. Aside from that declaration, however, most of the policies that have been articulated by the Abe government have focused on boosting Japan's IT sector rather than encouraging greater use of IT by other sectors. The Abe government's focus on promoting innovation and increasing the availability of venture capital to support new business formation is laudable and may well result in a more robust Japanese IT sector over the longer term – though bolstering the IT sector may require more substantial reforms than the government has proposed thus far.[21] However, for the Abe government to realize the imperative of achieving sustainable growth, boosting IT investment in inefficient sectors is the more urgent task.

The Abe government's next steps

To its credit, the Abe government recognizes that it needs to do more to promote greater IT investment outside the IT sector. The government's Industrial Competitiveness Council (ICC), which has spearheaded the drafting of growth strategies, has already indicated that its focus for this year's growth strategy will include policies aimed at maximizing Japan's potential growth. The council previously stressed the need to increase the earning power of small- and medium-sized enterprises (SMEs) in the service sector and to achieve breakthroughs in the use of the Internet, Big Data, artificial intelligence and the "Internet of Things" (IoT).[22] The ICC's plan for 2015 also will stress the importance of fostering new sources of human capital through higher education reform and greater employment opportunities for women and immigrants. Until the government issues its growth strategy in June, however, it is unclear exactly how the government will achieve these goals.

Ultimately, raising the productivity of Japanese businesses will depend less on policies directed at promoting innovative technologies and more on education, labor market and business policies. It is not sufficient to call for more "flexibility" in the labor market: with the emergence of temporary "dispatch" workers, the Japanese labor market is more flexible than in the past. The challenge going forward is to enable and encourage experienced laborers to seek new opportunities, create new businesses and lend their expertise to startups. In addition, Japan must provide college graduates with the skills necessary to opt out of the "simultaneous recruitment" process and start a new business, confident that they will still be able to advance even if their venture fails. Prime Minister Abe himself has long stressed the need to create a society in which individuals can "challenge again and again." If workers can leave stable jobs without having to worry about their subsequent employment prospects, small businesses may have an easier time investing in labor-saving technology. But increasing worker confidence in taking risks will require both significant policy adjustment and bottom-up cultural change to encourage individuals to exploit new opportunities.

The prime minister himself recognizes that while policy is important, it is not sufficient. Speaking in April at the third-annual New Economy Summit, hosted by the Japan Association of New Economy (JANE, formerly the Japan e-Business Association), which convenes executives,

[21] See, for example, Keio University professor Jim Foster's recommendations for strengthening Japan's IT sector. <http://kipis.sfc.keio.ac.jp/this-is-the-first-blog-post>.
[22] Industrial Competitiveness Council, Cabinet Secretariat, *Seicho senryaku shinka no tame no kongo no kento hoshin*, 29 January 2015. <http://www.kantei.go.jp/jp/singi/keizaisaisei/skkkaigi/dai20/siryou3.pdf>.

entrepreneurs and policymakers to discuss innovation, Abe said: “No matter how much the Government of Japan advances reforms, unless all of you in the private sector with an abundant entrepreneurial spirit take action, Japan will not change.”[23] While the Prime Minister and his government appear headed toward getting the policies right, convincing the private sector to make adjustments remains a challenge.

[23] Prime Minister Abe Shinzo, “New Economy Summit 2015,” 7 April 2015. <http://japan.kantei.go.jp/97_abe/actions/201504/7article1.html>.