

## Innovation

### STRENGTHENING INNOVATION FOR PRODUCTIVITY AND GREATER WELLBEING

- ▶ To improve productivity and help address socio-economic challenges, such as ageing, Japan needs to strengthen its innovation performance.
- ▶ Business investment in R&D is strong, but the quality and impact of public investment in R&D should be improved. This requires greater international collaboration, e.g. by increased international mobility of researchers, and stronger linkages with industry.
- ▶ Making the most of Japan's talent pool requires ensuring that women have equal opportunities to contribute to science and innovation.
- ▶ Access to digital networks is high in Japan and Japanese firms lead in many areas of digital technologies, but unleashing the transformative impact of digitalisation requires policies to foster skills development, organisational change and business dynamism.

#### What's the issue?

Japan is amongst the world's largest investors in science and innovation, spending almost 3.5% of GDP on research and development (R&D) in 2015, the third highest in the OECD area. However, this investment in innovation has not translated into strong productivity growth and business investment in R&D only topped pre-crisis levels in 2014. Japan's overall investment in knowledge-based capital also lags that of other major OECD countries.

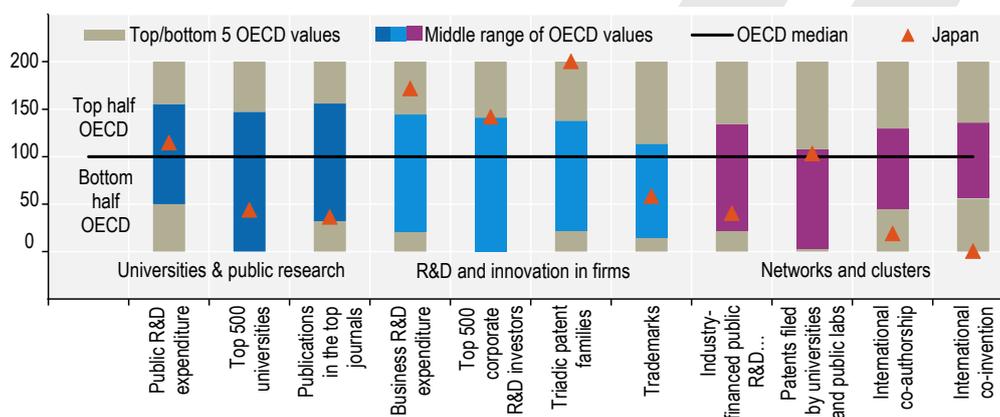
Japan's public R&D expenditure per GDP amounted to 0.71% in 2014. Although slightly above the OECD median, this is modest in light of Japan's high overall R&D intensity. The number of universities of global stature,

the level of publications in top academic journals and the international mobility of researchers rank low compared to the OECD median (see Figure). Moreover, there is little cooperation between universities and industry. These indicators suggest that Japan's public research could be strengthened further. The government has recognized the challenge and the 5th S&T Basic Plan (2016-20) aims to develop fields at the knowledge frontier.

A second challenge is Japan's low openness to foreign knowledge and technology, as shown in the low levels of international co-authorship and co-invention and

#### Stronger cooperation between industry and academia and with other countries would enable Japan to make more out of its high R&D spending

Comparative performance of Japan's science and innovation system, 2016



Note: Normalised index of performance relative to the median values in the OECD area (Index median=100).  
 Source: OECD, Science, Technology and Innovation Outlook 2016 - Country Profile Japan, OECD Publishing, Paris.

the low levels of foreign direct investment. Given the importance of foreign knowledge for innovation, this lack of openness limits the diffusion from global innovation leaders to Japanese firms, reduces international cooperation, and reduces the quality and impact of public and private research.

A third challenge for Japan's innovation performance is the low participation of women, who accounted for only 15.3% of all researchers in Japan as of March 31, 2016. Moreover, the participation of young women in doctoral science and engineering programmes is low. In a context of ageing, this implies that the skills of many highly trained women are underutilised and that the associated social and individual investments in education are at risk of being lost. Improving the participation of women in science and innovation is not only important for equity reasons, but can also help improve research and innovation and open up new market opportunities for Japanese firms.

The digital transformation can spur innovation and productivity growth across many activities, transform public services, and improve wellbeing as information, knowledge and data become more widely available. Japan continues to be an important driver of the digital transformation as measured by patent applications in the field, and has rapidly rolled out its digital infrastructure, including high-speed fibre networks. It aims to make the country "a leading digital economy by 2020". Achieving this goal requires attention to ensuring the effective use of digital technologies within firms, by individuals and within the government. Japan will need to help equip people with ICT and other appropriate skills to use the technology; enable complementary investments in organisational change and process innovation, and foster competition and sound firm dynamics.

## Why is this important for Japan?

Labour productivity levels in Japan continue to lag top OECD countries and productivity growth has been low for many years. In a context of slow productivity growth and ageing populations, strengthening innovation is imperative for Japan. More and better innovation can improve productivity, provide new sources of competitive advantage, create new jobs, and help address socio-economic challenges.

## What should policy makers do?

- ▶ Continue to strengthen the quality of public research, including the links between universities and business.
- ▶ Further enhance the openness of the Japanese economy to foreign knowledge and technology, including by continuing to encourage greater international mobility of researchers.
- ▶ Strengthen the engagement of women in science, innovation and entrepreneurship.
- ▶ Foster the effective use of digital technologies by governments, firms and individuals.



## Further reading

OECD (2016), *Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/25186167>

OECD (2015), *OECD Science, Technology and Industry Scoreboard 2015: Innovation for growth and society*, OECD Publishing, Paris. [http://dx.doi.org/10.1787/sti\\_scoreboard-2015-en](http://dx.doi.org/10.1787/sti_scoreboard-2015-en)

OECD (2015), *The Innovation Imperative – Contributing to Productivity, Growth and Wellbeing*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264239814-en>

