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Opinion

China in a time of change – China and the technology race

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The bright lights of China's metropolises connected by a state-of-the-art high-speed rail network featuring 30,000km of track (compared with 32km in the US) are just part of the story. Despite four decades of rapid growth, and even after adjusting for a generally lower cost of living, average incomes in China are still only approaching one-third of those in the US.

Against this backdrop, that the Chinese government would have an industrial policy – titled 'Made in China 2025' – to promote technological progress and innovation is unremarkable. Indeed, back in 1993 the World Bank published a widely-read monograph documenting how 'targeting key industries for rapid development' was a hallmark of the Asian economies that rose to prominence well before China did. Germany, too, has its 'Industry 4.0'.

Just because an industrial policy exists, deploying subsidies and other measures, this does not mean it will be successful. The World Bank assessed that the track record for Asian economies was mixed and the latest academic studies on China find that the impact of government policy incentives on a particular industry's output has tended not to be long-lasting.

But rather than seeing 'Made in China 2025' as largely run-of-the-mill, in October 2018 US Vice President Mike Pence described it breathlessly as 'the Communist Party [setting] its sights on controlling 90 percent of the world's most advanced industries'. Pence claimed 'Beijing has directed its bureaucrats and businesses to obtain American intellectual property – the foundation of our economic leadership – by any means necessary'.

This recalls a view put in 2013 in conversation between US Vice President Joe Biden and Australian Foreign Minister Bob Carr: 'China does not innovate'. That the only way – or even the main way – China is able to gain ground on the US is through intellectual property (IP) theft is delusional.

To be clear, Chinese entities have engaged in IP violations, and given China's sheer scale, as well as close ties between government and industry, this is problematic. In July, Christopher Wray, Director of the Federal Bureau of Investigation, said his organisation currently has more than 1,000 active investigations into attempted theft of US IP 'with almost all leading back to China'.

But this does not take away from the fact that China spends nearly the same amount the US does on research and development, closing in on $US500 billion every year. A report by the US National Science Foundation

estimated that in 2016 China had 1.7 million active researchers. This was greater than the 1.4 million in the US, and up from less than 1.2 million in 2009.

While stealing IP can fast-track a country approaching the technology frontier, it cannot generate new knowledge or new goods and services. Yet in 2018, according to the InCites database of scientific research, the number of articles that included an author affiliated with a Chinese institution reached 443,291, up sharply from 194,000 a decade ago, and compared with 459,440 for the US. That said, quality is not the same as quantity, but even if the top one percent of most-cited articles is considered, China's total stood at an impressive 6,426, a dramatic increase from 1,643 in 2009, and not far behind 7,824 for the US.

Last year Chinese entities filed 53,345 international patent applications under the World Intellectual Property Organization's Patents Cooperation Treaty, up from 7,900 a decade ago and just behind the US with 56,142. In one industry level example, Chinese companies hold 34 percent of world-wide patents that underpin next-generation 5G telecommunications technology. The US share is 14 percent.

There remains ample room for improvement, but China's innovation success can in part be attributed to stronger IP protection. In the 2018 edition of the US Chamber of Commerce's International IP index, China increased its score for the sixth year in a row. The Chamber concluded: 'The challenges rights holders face in China are enormous—not least with respect to market access, commercialization of IP, physical counterfeiting, and online piracy—but unlike many of its peers, China is making concrete progress in building a 21st century national IP environment'. In February 2019, most members of the US Chamber of Commerce in China reported that IP enforcement had improved over the past five years. Another survey by the US-China Business Council also found that China's IP protection had improved over the past year. No members reported it had deteriorated.

It is also the case that China now pays $US28 billion a year in IP charges to entities abroad. This is up from $US20 billion four years ago.

What does all this mean for Australia?

Last year, the research and development (R&D) budget of a single Chinese technology company, Huawei, was greater than the combined R&D spend of all Australian businesses.

Australia accounts for less than one-half of one percent of the world's population, yet our share of global science and engineering research output – an indicator of knowledge being created in fields that will drive long-term prosperity – is more than six times that. The trick is being globally connected, particularly with leaders like the US and, increasingly, China. A report by the Australia-China Relations Institute in July found that this year China was set to become Australia's leading international research partner in terms of the total number of scientific articles produced. This is not to say that China is replacing the US. In fact, collaboration with China and the US is complementary, oriented towards the computer and physical sciences, and the life sciences, respectively.

In June 2019, Dennis Richardson, former Australian Ambassador to the US and Secretary of Defence, observed that if the US were to pursue a technological decoupling from China and Australia followed, it would risk 'for the first time, us not having access to the best technology'. In August, Peter Varghese, former Director-General of the Office of National Assessments and Secretary of the Department of Foreign Affairs and Trade said that, even with some trepidation about a more powerful, authoritarian China, 'for Australia, there is no sensible alternative to engaging China.... And the notion that global technology supply chains can be divided into a China-led system and a US-led system is both economic and geopolitical folly'.

If China behaves more assertively abroad and repressively at home, Australia is able to recalibrate its risk management responses accordingly, perhaps drawing on tools like Defence Trade Controls to do so. There's also challenging diplomatic work ahead ensuring that China is at the table helping to establish agreed upon

international rules around, for example, the responsible use of transformative technologies like artificial intelligence.

But Peter Varghese surely got it right. Not actively engaging with China in the technology and innovation space is a recipe for sending Australia's own interests backwards.

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