

Geoeconomic Brief – Technology

- Technological innovation is essential for continued economic growth, which is the basis of national power. But the pursuit of technological leadership by a rising power (China) can cause conflict with the current dominant power (the US).
- There are three ways to access or acquire technology: transacting, taking and making.
- And there are three ways to protect a technology lead: shielding, stifling, and spurring.

What is technology

Technology is more than just semiconductors and drones. Technology is *information* necessary for the development, production, or use of a product¹. It can include technical data such as plans, designs and instructions, as well as technical assistance such as skills and training.

Apart from hardware like semiconductors and drones, much of what falls under the term “technology” is “non-rivalrous”, that is, one’s use of the information or knowledge does not prevent others from using the same information or knowledge. Intellectual property regimes are intended to prevent (or exclude) the usage of information by others. Depending on the circumstance, such protection can incentivise or slow the creation of technology.

In some cases, having exclusive technology makes that technology more valuable. This is the case for military technology, where relative power is paramount. On the other hand, some technology is more valuable the more people use it. This includes digital communication networks and social media.

Technology in a geoeconomic world order

The geoeconomic world order is characterised by the blurring of national security and economic policymaking. This emerging dynamic is being fuelled by great power rivalry between the United States and China, and nowhere is geoeconomic rivalry more acute than in the technological domain.

Technological innovation is vital for the long-term economic growth of a country. In addition, civilian innovation may have military applications, providing a potential advantage on the battlefield, which increases a nation’s relative military advantage. Technological innovation is therefore a major contributor to national power and a quintessential policy domain where economic and security considerations intersect.

Technological development is even more pressing for rising powers such as China, which face an “innovation imperative”, defined by Andrew Kennedy and Darren Lim² as:

¹ This is the definition used by the Department of Defence.

² Kennedy, A & Lim, D 2018, ‘The innovation imperative: technology and US-China rivalry in the twenty-first century’, *International Affairs*, vol. 94, no. 3, pp. 553-572.

the need to acquire and develop new technologies in order to overcome the structural challenges facing middle income states and continue their international ascent

As a middle-income economy, the innovation imperative is twofold for China. Technology is needed for the economy to grow to high-income status, which is critical for the government's political legitimacy. It is also necessary for China's geopolitical rise, to bolster its national security and sustain long-term competition with the United States.

China's pursuit of technological leadership takes three broad forms (see below) — building an indigenous technology sector, acquiring existing technology through market means, and taking technology. Ultimately, Beijing perceives its reliance on Western technology as a strategic vulnerability, and sees the possession of an independent technological capability as both an economic and national security imperative.

Beijing's efforts have triggered bipartisan concern in the United States. These concerns stem from many factors, from the increasing dominance of Chinese companies in certain sectors, such as drones and facial recognition, to the perception of unfair practices, such as industrial espionage, subsidies and an unfair playing field for US companies operating in China. In response, Washington has implemented measures to constrain China's ability to pursue its technological ambitions. These measures include technology export controls, restrictions on Chinese researchers in the US, cracking down on undeclared scientific collaborations with China, and lobbying other countries to exclude Chinese companies from participating in their 5G networks.

Technology competition is therefore one of the most prominent vectors of strategic rivalry between the two great powers. Both China and the United States are seemingly bent on a technological "decoupling", but each wants it on its own terms. The US wants to maintain its technological leadership, while China wants to be more self-reliant as it becomes a global leader in its own right. The pursuit of "decoupling" in the US has made China even more aware of its current reliance on the US, increasing China's desire to be even more self-reliant.

Geotechnology toolbox

Technology acquisition

There are three ways to access or acquire technology: transacting (buying), taking (stealing) and making (building).

Transacting means purchasing technology. It could take the form of purchasing finished manufactured products, such as semiconductors or fighter jets, or buying the company that owns the intellectual property.

In the case of purchasing finished products, export controls could prevent certain products being purchased by a foreign entity, especially if they are used for sensitive military purposes. If there are no competitive alternatives, then the customer may be beholden to the supplier. If the technology/product is crucial for a country's defence or economic growth, this can become problematic if the bilateral relationship between the two countries becomes adversarial.

In some cases, companies would prefer to buy the company that owns the technology rather than the finished product. This avoids the problem of becoming reliant on the supplier. However, in many cases, such acquisitions require the approval of the target company's government. Such approval may not be given if the target company is in a sensitive industry.

A common tactic for developing countries is to incentivise foreign companies that wish to access the market to share their technology with domestic companies. This "exchange" of technology for market access (or "forced technology transfer") is one of the prominent grievances the United States has against China. The Chinese government, in contrast, has insisted that the transfer was not "forced" but rather agreed upon by mutually benefiting parties.

Taking means acquiring technology from a foreign entity through non-commercial means, such as theft or industrial espionage. Jurisdictions differ not only on what aspects of technology are protected as property in the form of "intellectual property" (IP), but also whether "taking" IP is prosecuted as a crime or subject to civil damages (as a civil action). For example, in the United States, industrial espionage was criminalised in 1996. In Australia, there is no crime covering the theft of trade secrets for those who act on behalf of a domestic entity or a foreign non-government principal. Rather, owners of intellectual property enforce their rights through courts or via mediation and arbitration. And in many cases, businesses rely on trade secrets through physical restrictions and contractual constraints.

"Taking" can be done by an individual or company targeting another company. For example, there is a series of ongoing lawsuits between Apple and Samsung for patent infringements. It can also be the case of a country targeting another company or country. For example, members of the People's Liberation Army Unit 61398 were indicted on charges of IP theft from US companies, including Westinghouse Electric and United States Steel.

Making is investing in research and development (R&D) to develop new technologies. Businesses make their decisions on whether or not to invest in R&D, given their own expected pay off. This payoff will be affected by a country's intellectual property laws and the tax treatment of R&D investments. The state can also directly subsidise research and development, through grants to private organisations or through public research institutions.

By its very nature, cutting edge R&D is much more uncertain than acquiring new technology through "transacting" or "taking". But companies or countries still pursue R&D for several reasons. One, "transacting" or "taking" may not be possible due to enforcement of national security laws and strong cyber defence. Two, there is currently no suitable existing technology.

As developing economies become more advanced and move up the value chain, they will need to invest more and more in their own technological innovation ("making"). As a result, they are likely to want stronger IP protection.

Maintaining technological lead

Countries that are already technology leaders, such as the US, are more interested in protecting this technological lead. Anthea Roberts, Henrique Choer Moraes and Victor Ferguson³ frame these options as shielding, stifling, and spurring.

Shielding is protecting a technology from being accessed or acquired. The purpose of this is protecting domestic technology from “transacting” or “taking”. Shielding includes tactics such as punishing those who engage in industrial espionage, restricting research collaboration, and enforcing national security screening for foreign investment.

Stifling is inhibiting competitors’ capacity for accessing or acquiring technology. The purpose of this is preventing competitors from “making”. But in order to do that, it also aims to stop competitors from “transacting” or “taking”, both of which would increase the competitor’s capacity. Stifling includes tactics such as pressuring competitors to drop their industry support, banning the sale of critical components such as semiconductors, and preventing the adoption of competitor’s technology.

Spurring is stimulating technological innovation. The purpose of this is to maintain technological leadership by “making” faster than the competitor. It includes tactics such as increasing government research funding, adopting industry support, and attracting talent from around the world.

Out of the three, spurring is likely to result in the most open economic policy while some tactics under stifling can run contrary to international trade and investment law.

Conclusion

Technology is now a central node of geoeconomic competition, and governments will increasingly view innovation policy through the lens of geopolitical competition and strategic rivalry. Great powers of centuries past have usually dominated the high-tech sectors of the day, making today’s technology contest a critical factor defining international politics in the 21st century.

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³ Roberts, A, Choer Moraes, H & Ferguson, V 2019, ‘Toward a Geoeconomic Order in International Trade and Investment’, *Journal of International Economic Law*, vol. 22, no. 4, pp. 655-676.