The Sino-U.S. Tech Race

Some myths and realities.

By Chi Lo

Since the collapse of U.S.-China trade negotiations in early May, the public position of both sides has hardened. The inclusion of Chinese tech giant Huawei and its affiliates on the United States' Bureau of Industry and Security Entity List has also aggravated the trade tensions. The "blacklisting" of Huawei Technology effectively bars U.S. companies from selling or transferring technology to Huawei without a license issued by the BIS. Meanwhile, if the United States does follow through on its threat to impose 25 percent tariffs on all Chinese exports, not only would the losses to China escalate considerably, China would also become much less attractive as a global manufacturing base, costing it inflows of foreign investment and technology.

A China barred from selling and buying to the world's largest economy can hardly become the global center of technology and innovation dreamed of by its leaders. Indeed, technology competition lies at the heart of the Sino-U.S. trade conflict, with Beijing's "Made In China 2025" industrial policy being a focus of contention. The United States is worried about lavish government aid enabling China to overtake American technological leadership and threaten American national security. Meanwhile, China views Washington's pushback as hostile containment of its global ascent. Fears and misunderstandings about this conflict have aggravated its global disruptive impact and pose risks both to the United States and the world. In particular, a Cold

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War-style strategy toward China may backfire on the United States and hurt the world via a contractionary spiral in global trade and investments. But these disruptions do not have to go so badly, as better understanding of this Sino-U.S. tech competition can help governments make better-informed decisions.

IS "MADE IN CHINA 2025" FORMIDABLE?

China does have a thriving digital sector with formidable smartphone producers and giant internet companies leading a strong position in developing artificial intelligence. It now dominates the new fifth-generation mobile telephone technology, notably with Huawei working out the technical standards for 5G and developing commercial equipment to implement it at lower cost than available from U.S. firms.

A Cold War-style strategy toward China may backfire on the United States.

Concerns about China's tech success so far are mostly focused on downstream consumer-oriented technologies. But the MIC 2025 policy is adding to concerns by boosting China's upstream sectors, such as semiconductor and mobile equipment, creating gigantic component suppliers to challenge the existing industry leaders. China's huge domestic customer base is creating a favorable backdrop for Chinese chipmakers to develop competitive technologies which they can export.

Add in the Chinese government's intervention, which is embedded in the MIC 2025 policy, in the form of subsidies and shutting out foreign competition, and Beijing is seen as playing foul by fostering Chinese technological advancement at the expense of foreign countries. For example, Beijing has driven out Facebook and Google to give local companies, such as Baidu and ByteDance (both are among global leaders on AI research), a protected environment to thrive in a vibrant domestic market. The violation of U.S. sanctions on Iran by some Chinese tech firms, notably Huawei and ZTE (another telecom equipment and systems maker), has also deepened the international mistrust in China. Thus, the potential success of MIC 2025 is creating worries in the U.S. national security community about Chinese equipment sitting at the core of the next generation of mobile networks.

Many of the concerns are valid. But the fear about government intervention boosting Chinese technology and threatening the United States may be exaggerated. This is because the protected environment has trapped many Chinese firms in a Galapagos syndrome. Consider several successful Chinese companies, such as Alibaba, Tencent, Baidu, and ByteDance. The "great firewall" that Beijing has built has no doubt shielded them from foreign competition. But it has also deprived them of an aptitude for international competition, as the large domestic market has created a comfortable "archipelago" in which they can thrive.

This is not to say that Chinese firms cannot, and will not, challenge the world. They have and they will, but not necessarily under government directives such as MIC 2025. Indeed, such official plans and targets were not behind the success of China's most innovative technology companies. Huawei was shut out of the most lucrative government contracts for building mobile infrastructure in its early days because it was not a state-owned enterprise like ZTE and Datang. But that disadvantage did not bar Huawei from rising to become a national champion. Neither is the success of major Chinese smartphone companies Xiaomi and Oppo due to state support.

Their success is due to some common market factors, including availability of a large talent pool—over half of the eight million annual university graduates in China have STEM degrees—who can quickly copy new features, easy access to software licenses from Android, availability of an experienced labor force for assembling electronics, and a huge domestic market.

These success stories do not support the argument that state backing would create competitive companies. If

No Evolutionary Pressure

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America wants to fear, fear China's "tech animal spirits." With or without MIC 2025, the world will face the disruptive forces brought about by the rise of Chinese technology anyway, in my view.

THE PATENTS MYTH

But is Chinese technological prowess, rising so quickly and so strongly, about to take over the world soon as most observers fear? Ostensibly, China claims to have filed the largest number of domestic patents in the world, making it one of the most innovative countries, overtaking South Korea, Japan, and the United States as the largest domestic patent owner beginning in 2011. This data has prompted many observers to claim that China would become a global tech giant challenging the U.S. leadership soon. But that could be an illusion.

There are three types of patent: invention, utility model, and design. The invention patent is the most difficult to acquire as it represents a breakthrough in process, concept, or design, and its scrutiny and approval processes are long (eighteen months or more). It is protected for twenty years and accounted for just a little over 20 percent of the patents granted in China in 2017.

Instead, it is the design and utility model categories, both with a ten-year legal protection, that have boosted China headline patent numbers. But many of these filings are less valuable, such as a design patent for a new shape of a cup or a utility-model patent for a playing-card dispensing machine on a casino table. These patents are not subject to rigorous examination and are granted within a few months.

Despite the huge number of patent filings, the discard rate for them is also very high. Data in 2017 showed that more than 90 percent and 60 percent of China's design and utility-model patents, respectively, were discarded within five years, as licensees balk at their escalating fees amid doubts about their usefulness. Meanwhile, patent fees were still paid on 86 percent of U.S. patents after five years, according to the United States Patent and Trademark Office.

This problem stems from Beijing's push on the domestic players to climb the technology ladder quickly. Subsidies and other incentives are geared toward making patent filings rather than making useful innovations. Hence, soaring filing volume does not translate into quality and sustainability. Furthermore, many people cheat the lax approval process for the design and utility-model patents by copying foreign patents and seeking approval in China, and many local companies abuse the patent filings to get tax benefits and subsidies. This phenomenon makes a mockery of MIC 2025's goal to make China a technology global leader.

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If the United States tries to isolate China, these trading partners may not follow, and the United States will end up isolating itself.

Chinese regulators are only just starting to notice some of these fraudulent practices. To be sure, the government's support for patents has bolstered some sectors, such as artificial intelligence and cloud computing. But the cheating and high disposal rates mean that China is still a long way from becoming a genuine technologically sophisticated nation.

WHAT ABOUT IP THEFT?

Intellectual property theft is surely going on. But to be fair, the increasingly accepted narrative in the West that China acquires technology mostly through forced technology transfer from multinational corporations investing in China and through outright theft has been exaggerated. Official data shows that China's payments of licensing fees and royalties for the usage of foreign technology have jumped four-fold in the last decade. IMF data also shows that China recently ranked fourth globally in the amount of licensing fees it paid to use foreign technology, even ahead of Japan, Singapore, Korea, and other advanced economies.

It is important to note that licensing fees in Ireland and the Netherlands are paid mostly by foreign holding companies residing in there for tax reasons. This means that domestic Irish and Dutch payments of intellectual property licensing fees are far less than what the headline

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numbers show, so that China's global ranking in licensing fees paid for technology used within national borders would be even higher.

All this is not to deny mischievous behavior in China's treatment of intellectual property and technology transfer. Research by the Federal Reserve Bank of Minneapolis estimated that half of the technology possessed by Chinese companies came from foreign firms. But there is no proof of the amount of theft and forced technology transfer, and it is not clear if these joint ventures are successful in enabling Chinese firms to compete unfairly with the foreign firms.

There is also evidence showing that China is trying to strengthen its IP protection laws. An IP court was set up in December 2018, and more and more foreign companies are starting to file patent infringement cases in Chinese courts. China may finally realize that better protection of IP, reforming the state-owned enterprises, and stopping forced technology transfer is increasingly in its self-interest. Given rapid growth of home-grown IP products, enhancing IP protection and making the state-owned enterprises more competitive are needed to promote local innovation to fulfill China's ambition to become a technological powerhouse.

THE ULTIMATE QUESTION

So is China closing the technology gap with the United States soon? Initial evidence suggests no. A country's technological capability can be gauged by its performance in international markets, as approximated by its intellectual property rights earnings and payments.

Foreign firms still produce about two-thirds of China's high-tech exports, and China's largest import item is integrated circuits. Moreover, over half of its technology imports come from just three countries—the United States (27 percent), Japan (17 percent) and Germany (11 percent), despite its efforts to boost domestic innovation. Granted, China is an important hub for technological production, but this production is largely controlled by foreign firms and dependent on the imports of high-value components.

Typically, countries with strong technology industries earn big incomes from licensing their technology to firms in other countries. But China's IPR earnings are dwarfed by those of the United States and Japan, and it runs a chronic IPR payments deficit while the United States runs a huge surplus. All this suggests that China is not closing the technological gap with the United States rapidly. Furthermore, China's industrial policy may just be aiming at being self-sufficient but not generating IPR revenues. This data together with the Galapagos syndrome do not support the view that the United States is at imminent risk of losing a technological race with China.

THE RISKS

All this argues that the Sino-U.S. trade war risk has mutated from the macro level (in terms of market volatility) to the micro level (in the technology sector), which will last for a long time. The risk to the world is that U.S. technological protectionism, manifested in an aggressive foreign policy, would prompt an aggressive Chinese resistance that would hurt the world by disrupting the global tech supply chain and creating a contractionary spiral in global trade and investment dynamics.

U.S. President Donald Trump's "America First" approach has increasingly been seen by China as hostility to its ascent in the global system. On the one hand, this could create a benign unintended consequence for China by rallying more domestic support for Chinese President Xi Jinping's structural rebalancing efforts. On the other hand, China's hardliners could hijack this hostility perception and push for defending national security and reversing the opening-up policy.

Meanwhile, some Chinese national-security hawks have "demonized" the Belt and Road Initiative, forcing Beijing to scale back on this ambition. The slowdown in the Belt and Road Initiative will inevitably choke off one of the world's few resources for development finance for much-needed infrastructure and public goods in the developing countries.

Last but not least, those voices in the Trump administration calling for decoupling and isolating China through a new Cold War are risking hurting the United States more. As of 2017, 144 countries had more trade with China than with the United States, including fifty countries in Africa and Asia. If the United States tries to isolate China, these trading partners may not follow, and the United States will end up isolating itself. This revives the argument that the United States would have a better chance of changing China's behavior through a multilateral mechanism, such as the Trans-Pacific Partnership. But Trump, unfortunately, rejected this approach on day one when he came to office. ◆