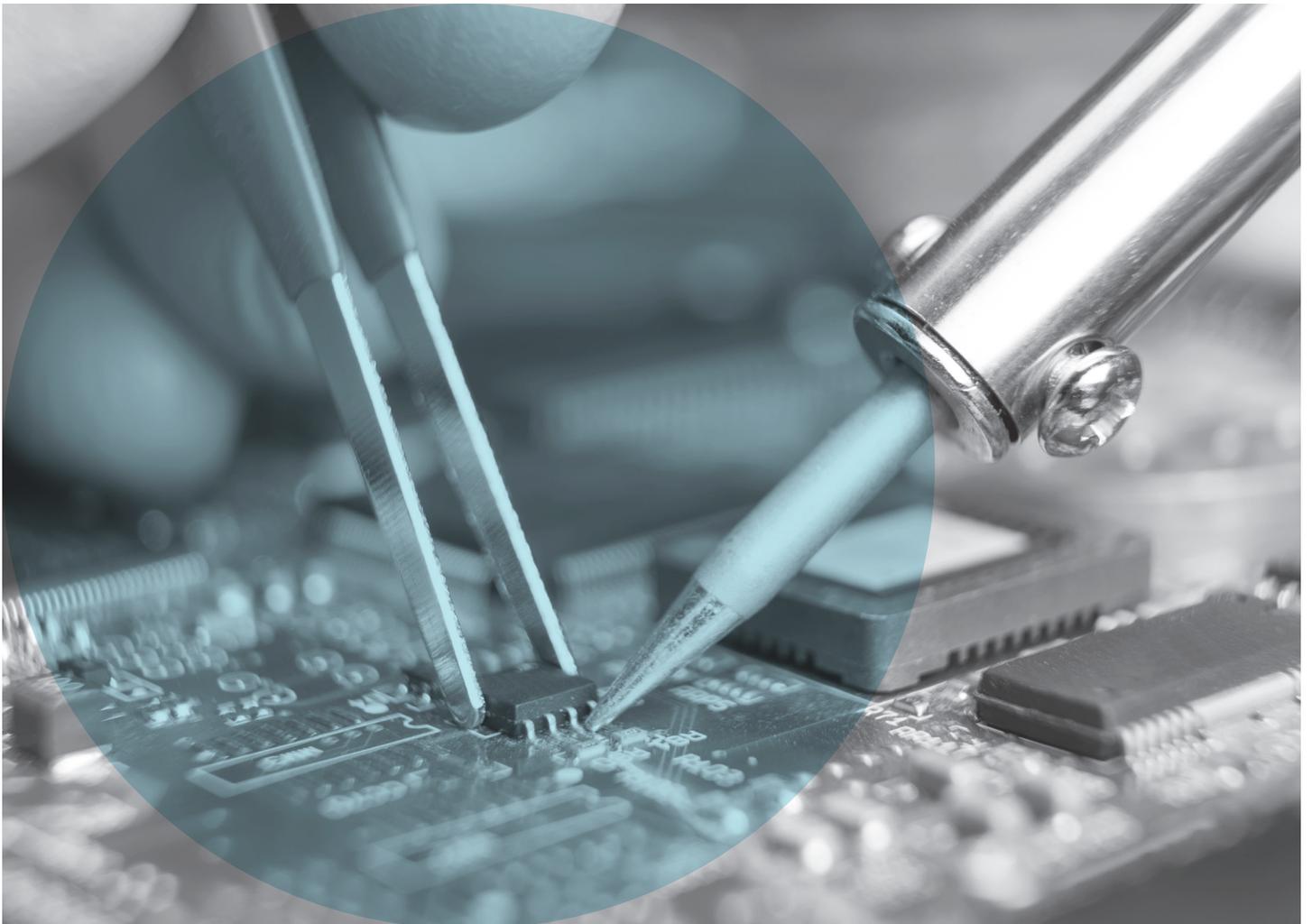


Strategic US-China decoupling in the tech sector

Why and how it's happening

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Introduction

The China-US geopolitical competition has reached a tipping point and morphed into a new “cold war” even as extensive trade and commercial ties continue on uncertain terms. Multinational companies face this new reality.

Ongoing tariff disputes which began in 2018 have resulted in supply chain decoupling from China. These events have been accelerated by the 2020 coronavirus pandemic, and the tech sector has become ground zero for these trends.

COVID-19 has laid bare the systemic differences between China and the US, particularly the challenges posed by Beijing’s state-planned economy, which has grown to almost 20% of global GDP.

A recent White House document lays out the prevailing bipartisan Washington mindset regarding China: “The CCP [Communist Party of China] has chosen to exploit a free and open system and rules-based order and attempt to reshape the international system in its favor.”¹

Geopolitical competition between the US and China, therefore, has reached a historic tipping point. It has taken on the characteristics of a new “cold war”, even as extensive trade and commercial ties – which have been built up over decades – continue on uncertain terms. This is the China conundrum facing multinational businesses.

Techno-nationalism

Twenty-first century US-China geopolitical competition will become increasingly rooted in techno-nationalism – a set of mercantilist-like behaviors that link tech innovation and enterprise directly to the national security, economic prosperity and social stability of a nation.²

At the 2020 National People’s Congress, for example, the CCP announced that in addition to doubling down on its Made in China 2025 and China Standards 2035 initiatives, it would spend an astounding US\$1.4 trillion on a digital infrastructure public spending program. The combined spending and initiatives are intended to shore up China’s plans to dominate in technologies and industries of the future.³

This is techno-nationalism on an unprecedented scale. Thus, as policy makers and business leaders outside of China contemplate this new reality, a new set of outcomes will emerge:

- Certain strategic value chains will decouple, restructure and diversify out of China.
- The US, EU and other state-actors will focus increasingly on countering Beijing’s economic nationalism with techno-nationalism initiatives of their own.
- Re-shoring and ring-fencing of some critical manufacturing will be unavoidable.
- New public-private partnerships, alliances and programs will need to emerge to compete with Chinese state and non-state actors.
- Multinationals will need to adjust to a world of increasingly fragmented and localized value chains.
- Businesses will have to adopt “in-China-for-China” business models if they wish to access the Chinese market.

The CCP just announced that it would spend an astounding US\$1.4 to 2 trillion on a digital infrastructure program that will accelerate China’s plan to dominate in technologies and industries of the future.

Overview of this study

This study is part of a series of Hinrich Foundation essays, authored by research fellow Alex Capri, that examine the rise of US-China techno-nationalism and its implications for global trade and international businesses. This analysis is comprised of three sections:

Section I – Economic techno-nationalism: The rise of Huawei (a case study)

Section I examines how the global technology landscape has come to be where it is today and presents the confrontation between Huawei and the US government as a microcosm of the larger issues fueling the US-China technology war. It examines Huawei's meteoric rise and how subsidies, government-backed credit programs for customers, and the Digital Belt and Road Initiative contributed to the success of Huawei, and Chinese tech companies in general.

This section also examines how American and foreign multinational behavior regarding technology licensing and the offshoring of manufacturing shaped today's global landscape and the rise of a new generation of world-class Chinese companies like Huawei and DJI, the world's dominant maker of civilian drones.

Section II – Strategic decoupling, re-shoring and ring-fencing of key industries (TSMC case)

This section introduces the latest techno-nationalist countermeasures employed by the US, focusing on Washington's leveraging of new export controls, before diving down into another Huawei-related high-profile case: Taiwan Semiconductor Manufacturing Company (TSMC) and its construction of a leading-edge microchip fabrication plant in the US.

This section explores the dynamics of re-shoring and ring-fencing of strategic industries and how this will impact state and non-state actors.

Section III – The China conundrum: Navigating an uncertain future landscape

Section III explores the uncertain landscape facing American and other foreign companies doing business in China. It continues with an analysis of Huawei, focusing on future scenarios involving retaliatory actions by the CCP on US and foreign companies, the "de-Americanization" of supply chains and finally, what may lie further over the horizon for American and foreign companies in the form of new public-private partnerships, a topic which will be continued in the second essay in the series.

I. Economic techno-nationalism: The rise of Huawei (a case study)

Huawei's meteoric rise has amplified long-standing assertions about its connection to the Chinese state and its role as proxy for the CCP's techno-nationalist agenda.

In 2019, despite strong headwinds from a US-China trade war and an ongoing US campaign to block Huawei's 5G products from markets around the world, Huawei posted record revenue of US\$122 billion.⁴

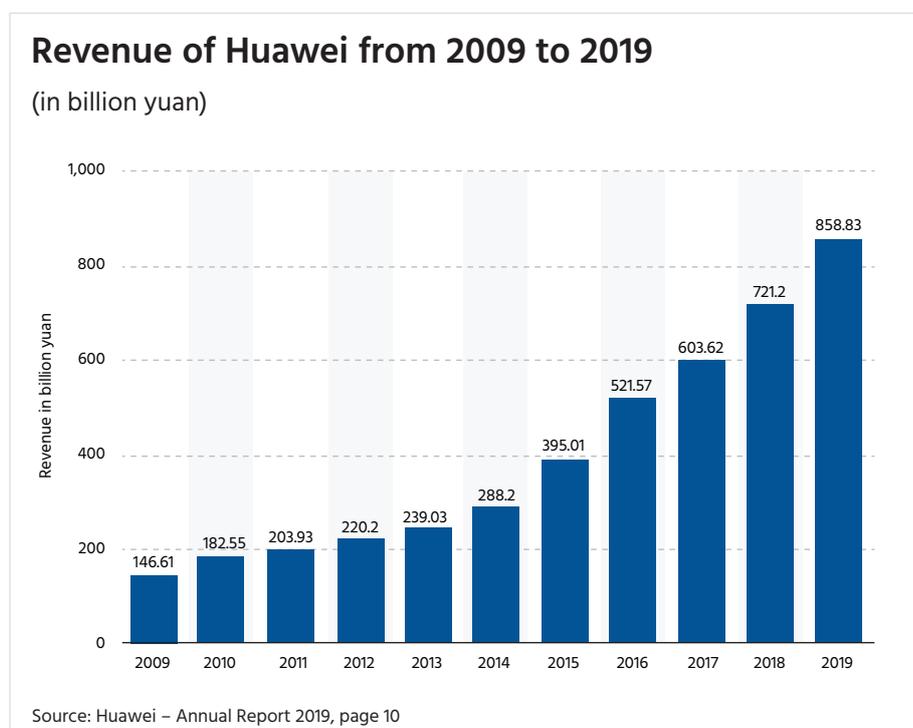
Huawei has not only become the largest telecommunications equipment manufacturer in the world, it also represents the leading-edge of expanding Chinese techno-economic and geopolitical power.

That same year, according to its corporate communications, Huawei was operating 5G wireless contracts⁵ with 35 carriers in 20 countries and had sales of 5G

distributed spectrum equipment in another 33 countries. By February 2020, Huawei's executives reported that the number of global 5G deals had increased to 90.⁶ In addition to its growing market share in the 5G wireless space, the company shipped some 240 million phones, surpassing Samsung in 5G smart phone sales.⁷

Such a meteoric rise for any company, in such a short period of time, is highly unusual: from 2009 to 2019, alone, Huawei's global revenues increased from just US\$20 billion to its latest year-on-year record breaking number of US\$122 billion.

Chart I – Huawei revenue 2009-2019



Democratic Speaker of the House Nancy Pelosi said that choosing a Huawei 5G network was “about choosing autocracy over democracy” and “putting the Chinese state police in the pocket of every consumer.”

Huawei’s rapid rise has amplified long-standing assertions about its connection to the Chinese state, and its role as a proxy for the CCP’s techno-nationalist agenda. In Washington, China hawks – and even moderates – have reached a consensus that Huawei has benefited, either directly or indirectly, from the CCP’s techno-nationalist policies.

As described in the 2018 United States Trade Representative’s (USTR) “Section 301” investigation into “*China’s acts, policies, and practices related to technology transfer, intellectual property, and innovation*”⁸, for decades the CCP has been forcing transfer of technology to Chinese entities, implementing restrictions on licensing requirements, acquiring strategic technologies with state support and facilitating unauthorized cyber intrusions.

While the Section 301 report was short on quantitative detail, the document represents a defining moment in the political zeitgeist in Washington.

It is this last point regarding cyber intrusions and espionage that the US political and defense establishment has seized upon when focusing on the rise of Huawei.

At the 56th annual Munich Security Conference, for example, Democratic Speaker of the House, Nancy Pelosi, said that choosing a Huawei 5G network, was “about choosing autocracy over democracy” and that awarding a contract to Huawei would be like, “putting the Chinese state police in the pocket of every consumer in these countries, because of the Chinese way.”

The economic assistance provided by the CCP to Chinese technology firms will drive overseas policy initiatives to expand economic incentives and funding for selected industries.

China’s brand of economic techno-nationalism

The US has been pressuring its allies to reject Huawei’s technology on the grounds of cyber-security risks while, to date, at least publicly, there has been no conclusive evidence presented. However, clearly Huawei has benefited from a long history of economic and commercial assistance from the CCP.

It is subsidies rather than cyber security concerns that will increasingly drive policy makers in Washington and other places to resort to economic countermeasures.

According to a 2020 study conducted by the Wall Street Journal, throughout its rise to become the world’s top telecoms equipment manufacturer, Huawei has received some US\$75 billion in state-assistance.⁹

Types of economic and financial aid received by Huawei between 2008-2018, as calculated by the Wall Street Journal¹⁰ have included:

- US\$46 billion in loans and credit lines from government-backed state-lenders
- US\$25 billion in direct and indirect tax breaks
- US\$1.6 billion in special technology grants
- US\$2 billion in land discounts.

The scale of Beijing’s spending dwarfed what its closest foreign competitors received from their governments during the same timeframe. For example, the amount of state assistance that Huawei received was 17 times larger than similar subsidies

Chinese state-backed companies have been doubling down on expanding their international footprint as the CCP makes 5G networks and Chinese digital hegemony a top priority.

Cheap lines of credit from state-owned banks made available to Huawei's foreign customers have also underpinned its international expansion.

received by Finland's Nokia Corp, the world's second largest manufacturer of telecom equipment. Ericsson, of Sweden, the world's third largest, reported no government support in that timeframe.¹¹

Critics of the Wall Street Journal report have pointed out that since 2000, Cisco, the American telecommunications and networking equipment manufacturer, received about US\$44 billion in defense contracts, state grants and tax breaks during roughly the same timeframe.

The unfair cost advantage that Chinese companies enjoy as a result of subsidies is one of the reasons why US companies have neglected expansion into foreign markets. Chinese state-backed companies, meanwhile, have been doubling down on expanding their international footprints, as the CCP sees this timeframe as a critical

window to make 5G networks and Chinese digital hegemony a top priority.

As discussions increasingly shift towards the economic side of Beijing's techno-nationalism and away from Huawei cyber-security allegations, Washington and other governments will begin to expand their own economic incentives and funding programs for selected industries.

State-backed cheap credit for emerging markets

Cheap lines of credit from state-owned banks, made available to Huawei's foreign customers, have been another key to its international expansion. By assuring easy financing for a project, Huawei and other Chinese companies have been rapidly capturing market share in emerging markets.

CASE STUDY

India and Huawei

India provides a good example of how cheap lines of credit from state-owned banks were made available to Huawei's foreign customers.

As reported in The Hindu Business Line, in 2012 Reliance Communications, a telco, secured a US\$600 million loan from Chinese banks in order to purchase network equipment from both Huawei and ZTE, China's largest publicly listed telecoms manufacturer.

But in addition to getting cheap financing to buy equipment, both Huawei and ZTE were instrumental in linking Reliance to an additional US\$1.8 billion in loans from the Export-Import Bank of China, the China Development

Bank, and Industrial and Commercial Bank of China. Reliance used this money to repay its Foreign Currency Bonds (FCCBs) which were coming due that year.¹²

In 2019, Reliance filed for bankruptcy – which has revealed another salient aspect of Chinese state-backed financing in the world's emerging markets: a willingness to do business with members of wealthy elites, in businesses environments often described as "crony capitalism" – in this case, with the Indian billionaire, Anil Ambani, who would later famously declare bankruptcy under a cloud of alleged fraud and suspicion.¹³

China’s quest to dominate the industries-of-the-future is a central component of a larger blueprint to expand Beijing’s hard and soft power around the world. This is closely linked to the BRI.

By paving, building and connecting the overland silk route and maritime silk road with Chinese money, Beijing aims to enhance its economic, military and technological footprint.

In 2009, for example, the Pakistan government received a US\$124 million, 20-year interest free loan from China’s Export-Import Bank to purchase surveillance technology for its capital, Islamabad. The stipulation: the job would be awarded to Huawei, with no competitive bidding.¹⁴

As the US-China techno-nationalist competition accelerates, therefore, cases like these in India and Pakistan will continue to surface and serve as motivation for further actions in the US against Huawei and other large Chinese tech companies.

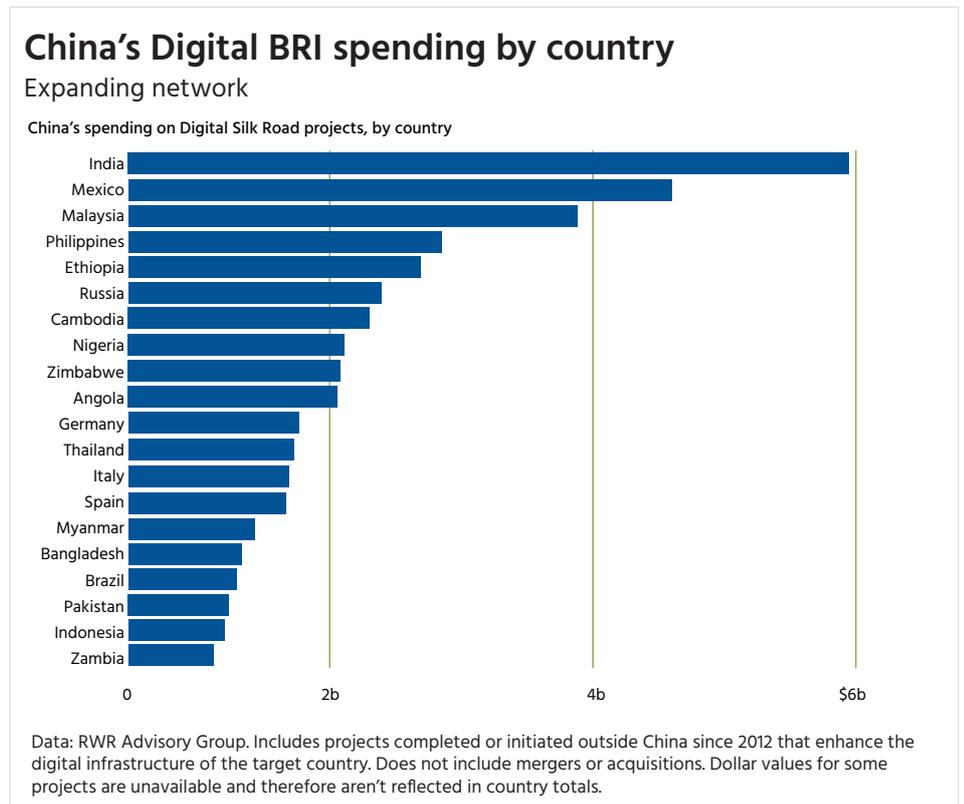
The risks of doing business in this environment will deter most foreign companies from wanting to participate in projects associated with, for example, the Belt and Road Initiative (BRI). It will also ultimately lead to more strategic decoupling.

Techno-nationalism and China’s Digital Belt and Road Initiative

China’s quest to dominate the industries-of-the-future is a central component in a larger blueprint to expand Beijing’s hard and soft power around the world. This is closely linked to the BRI – easily the most ambitious infrastructure project in history – designed to connect Chinese geopolitical interests in more than 60 countries through a network of infrastructure, at an estimated cost of some US\$4 to \$8 trillion dollars.¹⁵

By paving, building and connecting the historical overland silk route (the “belt”) and the maritime silk road (the “road”) with Chinese money – and by using state-owned or state-controlled companies – Beijing aims to enhance its economic, military and technological footprint. The CCP’s purpose for the BRI is clear: to tilt the

Chart III – China’s Digital BRI spending by country



world's geopolitical axis away from a US and EU-centric world order and towards its own state-centric model.

The digital component of the BRI, therefore, has become an increasingly important fixture in the US-China tech war.

Huawei's 5G networks will be at the heart of an ecosystem of Chinese tech-companies tapped by the CCP to build the Digital BRI: Beidou, the satellite network, will provide GPS services across entire regions; Alibaba and Tencent will enable cloud and e-commerce services; other big Chinese companies like Hikvision and Dahua Technology (facial recognition CCTV), SenseTime and Megvii (AI) are building the AI and data analytical frameworks required by the CCP.

The establishment of Chinese digital hegemony over a large swathe of the earth could make Chinese standards in 5G, cloud infrastructure, smart phones and other technologies the de facto standard for a large part of the so-called emerging world. The plan, then, is to create a virtuous cycle for both the Chinese state and its champion tech companies, giving them yet more scale and greater market advantages.

The involvement of Chinese companies is significant for several other reasons.

- **First**, as state-owned or state-controlled entities, they are massive in scale, thus even if market conditions – such as lack of demand – prevent other MNEs from expanding into some of the high-risk and unstable countries along the BRI, these Chinese tech giants can operate at a loss with state funding, allowing them to carry out the CCP's BRI agenda.

- **Second**, these projects will bring into sharp focus the ideological differences between democracies and what Beijing calls its “socialism with Chinese characteristics,” which embraces censorship and surveillance, along with a state-planned economy. Nations that adopt Chinese projects themselves become part of China's surveillance state network and equally have the opportunity to develop their own censorship regimes.

Tencent, the digital platform giant that owns WeChat, for example, designs surveillance systems for the CCP. HikVision and Dahua Technology, two of the world's largest makers of surveillance and facial recognition technology, provide the Chinese state apparatus with essential monitoring tools. SenseTime and Megvii, meanwhile, design the AI and software to operate these systems.¹⁶

All of these companies were recently added to the US Government's restricted entity list, on the grounds that their technologies were used to further human rights violations in Xinjiang province, in China's far West, where Kazakhs and other Muslim minority groups are being detained and forced in to “re-education” camps.¹⁷

There are three important takeaways from Washington's human rights-linked export controls:

- **First**, as Sino-US relations continue to deteriorate, ideological differences and values will increasingly drive techno-nationalist policy.
- **Second**, China's BRI will amplify these differences and serve to further fracture the world into different trading blocks.

As Sino-US relations continue to deteriorate, ideological differences and values will increasingly drive techno-nationalist policies. China's BRI will further fracture the world into different ideologically oriented trading blocks.

- **Third**, there will be collateral damage to a number of American tech companies, including Intel, Nvidia, Seagate and Western Digital, which have been supplying HikVision and others amongst the 28 companies on Washington’s blacklist.

Ideologically driven US export controls, therefore, will further accelerate the strategic decoupling of US and Chinese business.

How the licensing and offshoring model backfired on US companies

As the CCP was aggressively pursuing techno-nationalist initiatives to fund and support the growth of its national champions, US and foreign multinationals became addicted to a lucrative business model: the licensing of their baseline technology to large-scale and (at the time) relatively less advanced joint venture partners in China.

This approach started with China’s early “909” programs, in the 1990s, when companies such as Lucent technologies, AT&T and Alcatel began a trend of transferring ICT technology to nascent Chinese manufacturers.¹⁸ MNEs received increasing amounts of licensing revenue, which was then used to develop their next generation of products. Because of their commanding lead in innovation at the time, this seemed like a brilliant strategy.

For MNEs, the revenues generated from IP licensing to China were so enormous that the practice became the prevailing business model in the tech sector.

According to the Bureau of Economic Analysis (BEA) at the US Department of Commerce, between 2009 and 2019, US

tech companies earned US\$65 billion in IP license fees from China.¹⁹

By most accounts, the BEA’s numbers grossly under-report the value of license fees paid by US MNEs to Chinese entities. For example, they do not capture license fees paid to the offshore entities of US companies or their offshore designated third parties.²⁰

Huawei, alone, has paid more than US\$6 billion to license IP from third parties, 80% of which was to US companies, since 2001.²¹ The Chinese tech giant reports that it now has more than 100 patent license agreements (including unilateral and cross licenses) with major global ICT companies such as Nokia, Ericsson, Qualcomm, AT&T, Apple and Samsung.

All the while, however, manufacturing capacity was gradually offshored out of the US and other OECD countries and into China, a trend which accelerated after 2001, when China was accepted into the World Trade Organization.

In a non-hostile economic environment, this development might be justifiable, as global value chains are unbundled and naturally seek the most efficient and profitable distribution. But given Beijing’s unrelenting techno-nationalist imperatives, the licensing-dependent model ultimately backfired on US and other tech companies.

As the American writer, Hemingway, wrote: “A man goes bankrupt gradually, and then suddenly.” This could describe the plight of many US and foreign technology firms in the personal computer or telecommunication space, which presided over an almost complete shift to China, of both IP and manufacturing capabilities, in less than two decades. Today, most new innovations coming out of Silicon

US and foreign multinationals have licensed their baseline technology to large-scale joint venture partners in China that were, until now, relatively less advanced.

The rapidly growing licensing revenues were used to develop next generation products.

Today, most new innovations coming out of Silicon Valley cannot be manufactured unless they are made in China.

In exchange for market access, “improvements” to licensed technology were authorized, which constituted a de facto shift in IP ownership to the Chinese licensee.

The practice of technology licensing has resulted in a massive flow of technology-related IP to Chinese firms, vaulting Huawei and others to parity, or even enabling them to leap-frog their foreign partners.

Chinese firms benefit from simultaneous access to global capital markets and massive CCP support and funding. Multinational companies must be prepared for a new round of US techno-nationalist countermeasures, which will accelerate technology decoupling.

Valley cannot be manufactured unless they are made in China.

Backlash: China’s technology transfer laws

The USTR’s Section 301 Investigation report published in 2018 features more than 200 pages of the most comprehensive indictment of China’s technology transfer regime in a US government document.

Regarding the licensing of IP and technology, China’s rules were cleverly crafted: in exchange for access to the PRC’s vast market, foreign firms often unwittingly overlooked the liberties that the law granted to Chinese licensees – and the lack of any legal recourse for foreign firms.

Until 2019, Chinese law, for example, restricted foreign licensors from prohibiting or restricting the Chinese licensee to make “further improvements” to licensed technology. As a result, virtually any further “improvements” constituted a shift in the IP ownership to the Chinese licensee. This meant that even the slightest alteration of a design or blueprint of foreign technology could result in a new patent, filed by the Chinese firm.

Although in 2019 China abolished three articles from the TIER²² which were regarded as discriminatory against foreign investors, to date most attempts by the foreign IP owner to challenge the outcomes of technology improvements have been rejected by the Chinese courts on the grounds that the outsider was illegally monopolizing technology or blocking future innovation initiatives by the Chinese state.

Over time, subtle and pernicious practices regarding technology licensing agreements have resulted

in a flow of technology IP to Chinese firms of historical proportions, vaulting the likes of Huawei and others to parity or even leap-frogging over their original foreign partners.

In the case of Huawei, for example, according to the company’s website, it has over 85,000 patents. It claims itself to be the world biggest in ICT patents in Europe and is a top 50 patent holder in the US. The Chinese firm filed over 5,000 patents with WIPO in 2018 and is first in the world for patents related to 5G services.

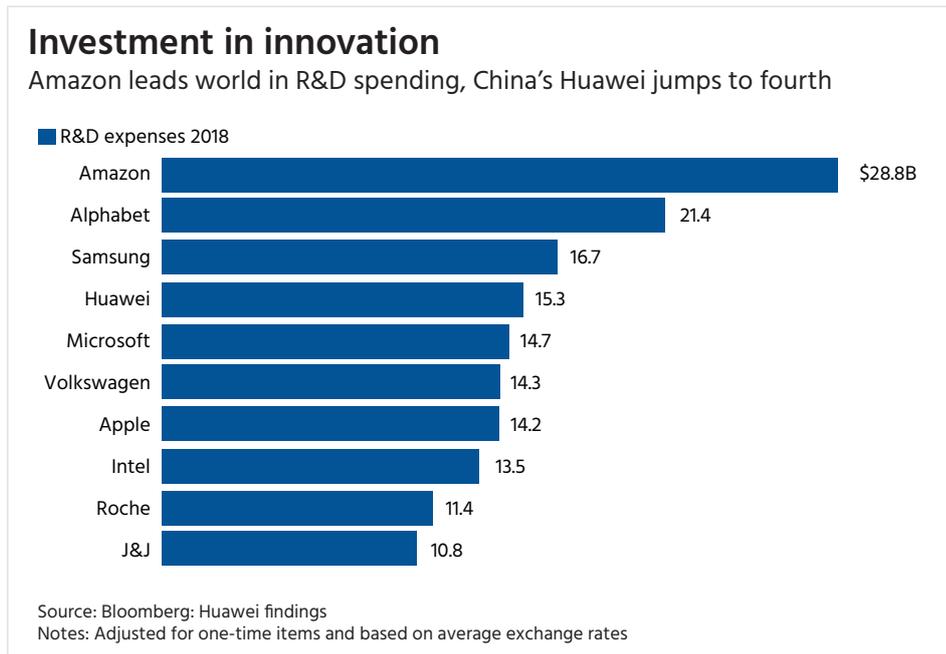
World-class Chinese companies

It would be a mistake to conclude that state subsidies, grants and other government backing are the sole reasons why China’s tech champions are coming to dominate market niches. On the contrary. Huawei, for example, has become a world class company by employing practices, strategies and a corporate culture that would be successful anywhere. These characteristics include:

- Human capital (some 10,000 engineers are employed by Huawei)
- Massive spending on R&D and innovation (US\$15.3 billion in 2019, more than Apple, Intel or Microsoft each spent in the same period)²³
- Generous incentives, awards and bonuses for employees
- Win-at-all-cost corporate culture and 24/7 mind set
- Long-term, forward looking perspective.

Chinese firms combine massive scale, high-quality human capital and a relentless work ethic. The techno-nationalist support from the CCP supplements these advantages and is a key differentiator for Chinese tech firms.

Chart IV – Investment in innovation by company



Even the hugely successful platform companies such as Tencent and Alibaba, which share the same competitive characteristics as Huawei, have been significant beneficiaries of Chinese techno-nationalism.

Access to global capital markets

Chinese firms benefit from access to global capital markets whilst simultaneously benefiting from the CCP’s massive techno-nationalist initiatives and funding.

Tencent, Alibaba and DJI (see spotlight) are listed on global stock exchanges

or partially funded through global private equity funds.

This illustrates the challenges confronting foreign MNEs, which must compete with the latest generation of Chinese tech companies.

In this regard, the Chinese are winning. Therefore, the global tech sector must prepare for a new round of US techno-nationalist countermeasures, all of which will accelerate strategic decoupling.

DJI drones



Another company that exemplifies the tectonic shift in the technology landscape is Da-Jiang Innovations (DJI), the Chinese maker of civilian drones. Founded in 2006 by Frank Wang, a mainland Chinese student who studied at the Hong Kong University of Science and Technology, DJI now dominates 72% of the world's drone market. DJI's success can be tied to five key factors, all of which are exemplary of China's carefully cultivated technology landscape:

1. Relentless innovation at scale

DJI has 1,500 engineers working on new designs, features and improvements for consumer drones. DJI's engineers have pioneered drone technologies including advanced GPS applications, wireless transmission, self-diagnosing software, stabilization and gimbal design.

2. Steady stream of new products

By releasing new products at a blistering pace, including the Mavic and Phantom series of consumer models, DJI has stayed ahead of the marketplace.²⁴

3. Localized end-to-end value chain

Going from the ideation-to-creation stages of a product in one single

location has conferred an enormous advantage to DJI. Its engineers can literally walk next door, on the company's Shenzhen campus, as they create, design, test and then mass-produce the product. This is an advantage, writ large, that Shenzhen – one of China's tech hot beds – has over Silicon Valley, where less manufacturing actually occurs.

4. Partnerships

DJI's massive market share has made it a lucrative partner for some of the world's best brands including Hasselblad, the Swedish camera maker and Sony. This dynamic has produced a virtuous cycle for DJI.

5. Manufacturing at scale

The scale of production of DJI's drones allows the company to sell them at a price point that is simply out of reach for other, smaller manufacturers.

Other would-be drone makers such as 3D Robotics and GoPro, both American companies, simply could not compete with DJI, given the circumstances, and gave up trying to manufacture drones, despite being first-movers in this space. Here, however, it becomes clear that the Chinese government's techno-nationalist policies were instrumental



– at least indirectly – in DJI’s success. Massive funding initiatives such as the Made in China 2025 plan have created a cluster of R&D, manufacturing, tech start-ups and incubators in Shenzhen. This, in turns, has created favourable conditions for DJI’s success, including access to human capital, key suppliers, and cheap government-backed credit and grants.

In 2014, GoPro formed a brief partnership with DJI, but GoPro’s management was uneasy with the relationship and opted to manufacture its GoPro drone prototype, the KarmaCopter, without DJI. The project was beset with failures, primarily because of extended foreign supply

chains, spiraling costs, technical problems and third parties that failed to deliver. GoPro exited the drone market. Meanwhile, DJI stormed the market, and has just come out with an action camera (OsmoAction) that looks and performs like GoPro’s action cameras. Here, again, the OsmoAction will sell at a lower price and be manufactured at a scale that could seriously challenge GoPro’s market share.

Even as DJI was benefiting from the local techno-nationalist dynamics in Shenzhen, it was also receiving funding from foreign investors and venture capitalists including Sequoia, a large US venture capital firm.²⁵

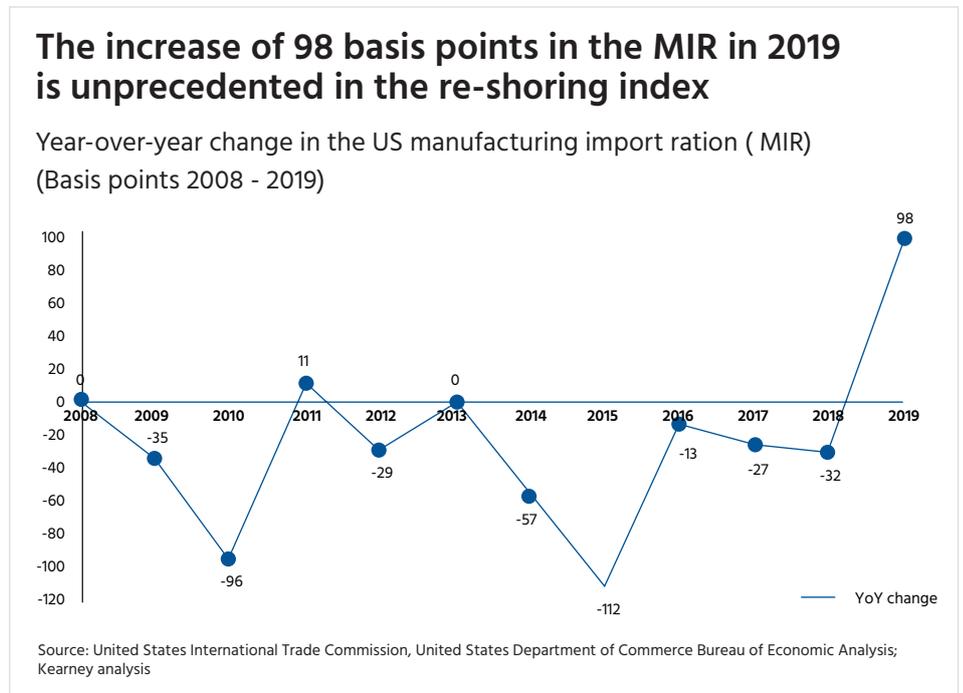
II. Strategic decoupling, re-shoring and ring-fencing

Global supply chains have been steadily decoupling from China due to the tariff disputes, US export controls and restrictions on Chinese tech giants.

Global supply chains have been steadily decoupling from China as a result of the US-China tariff wars and the escalation of Washington's export controls and restrictions on Huawei and other Chinese tech giants such as HikVision, SenseTime and Megvii.

Kearney's 2019 Reshoring Index, for example, registered the single largest ratio increase of US on-shore manufacturing over imports from China and other Asian countries in decades.²⁶

Chart V – Change in US manufacturing to import ratio



MNEs are moving some of their manufacturing and assembly operations to Southeast Asia. US companies are now also looking at re-shoring in Mexico and within the US.

A significant portion of supply-chain restructuring has involved companies moving manufacturing and assembly operations out of China and into Southeast Asia – into Vietnam, for example – but the other epic shift involves American companies looking to re-shore in Mexico and, increasingly, within the US.

More importantly, the Kearney index was published before the onset of the COVID-19 global pandemic, therefore the report does not capture the true magnitude of the imbalances and vulnerabilities facing multinational companies with China-centric value chains.

Specifically, the COVID-19 pandemic has exposed:

- 1. An overreliance on Chinese manufacturing and suppliers in critical industries** such as pharmaceuticals and medical equipment, automotive parts, computers, smart phones and other strategic commodities.
 - 2. A growing consensus both within the public and private sectors outside of China, that re-shoring and ring-fencing of strategic value chains must become a priority.** The Japanese government, for example, recently announced US\$2.2 billion in funds to assist Japanese companies to re-shore manufacturing and supplier operations out of China.²⁷
 - 3. Beijing's doubling down on funding initiatives to promote its techno-nationalist initiatives.** The CCP has announced that it will add US\$ 1.4 trillion to
- US\$ 2 trillion of funding to digital infrastructure initiatives – in addition to its Made in China 2025 plan – as it accelerates its efforts to dominate the industries of the future, which include AI, 5G, semiconductors, surveillance and other key technologies.²⁸
- 4. Washington's accelerated expansion of export controls and the weaponization of US technology supply chains,** primarily in semiconductor technology, as it looks to choke off vital microchips to Huawei and other Chinese tech companies.
 - 5. The deterioration of China-US relations, which have passed an historic tipping point,** confirming that the world's number one and two economies are officially in a hybrid cold war, which will require new China-strategies for the world's businesses.

Huawei, TSMC and American techno-nationalism

Foreign companies are now required to get a license to on-sell finished products if the manufacturing process involves American software, designs, tooling or manufacturing equipment.²⁹



In May of 2020, the US government undertook two unprecedented actions that will profoundly influence the global tech landscape. Both actions were aimed at Huawei, and more broadly, at China's tech agenda. Both actions also involved a third party: Taiwan Semiconductor Manufacturing Company (TSMC).

Ratcheting up export controls

In the first instance, the Trump administration ratcheted up its existing export control requirements by instructing the US Bureau of Industry and Security (BIS) to raise the bar on the so-called foreign "direct product rule." Now foreign companies are required to get a license before on-selling finished products if, for example, the manufacturing process involves American software, designs, tooling or manufacturing equipment.³⁰

This action was aimed directly at TSMC, which manufactures microchips for HiSilicon – Huawei's fabless chip designer. HiSilicon has designed chips for Huawei's smartphones and 5G infrastructure that are on par with

Qualcomm and can compete with Apple's smart phone technology.

Presently, however, there are no Chinese semiconductor companies that can produce HiSilicon's chips, as China lags substantially behind the world's leaders in microchip innovation and production capabilities.³¹ Thus, semiconductors are the Achilles heel in Huawei's value chain – and, indeed, in China's overall technology ambitions.

But TSMC relies on US semiconductor manufacturing technology from American firms such as Applied Materials, LAM research and KLA Tencor, which control more than half the market in this space. More critically, TSMC relies on special tooling (software and hardware to produce chips) from US companies such as Synopsis, Cadence Design Systems, and Mentor Graphics, which control 90% of the market.

Thus, if the US government denies export licenses for any of these technologies, TSMC – which is pushing the 5nm and even 3nm leading edge of chip manufacturing and has captured

For now, because the US semiconductor industry still dominates, Washington can leverage NTMs such as export controls and restricted entity lists to inflict damage on Chinese tech companies. This is producing negative side effects.

more than 60% of the world’s micro-chip contract manufacturing market – could be forced to cease production for Huawei.

Therefore, Huawei could be facing an existential crisis. The company is said to have stock-piled enough foreign-made chips to continue to service its 5G contracts for approximately a year, after which, unless it can convince TSMC to find substitutes for US technology – perhaps from Samsung and Tokyo Electron for manufacturing equipment, and for design tooling, from S2C, another Japanese firm – its business could be severely damaged. But these alternatives also pose challenges, such as transition complexities, costs, time lags and political pressure directed by Washington at the new suppliers.

Thus, in the short term, because of the dominant position of the US semiconductor industry, Washington can leverage non-tariff measures such as export controls and restrictive entity lists to cause disruption and inflict

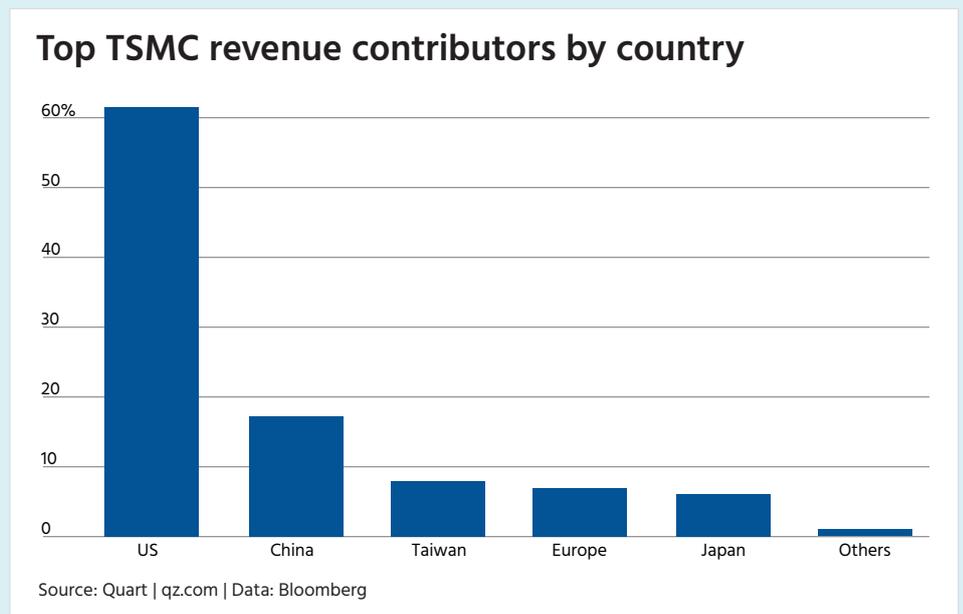
heavy damage on Chinese companies across a variety of technology niches. However, this will produce the following side effects:

- The acceleration of pre-emptive decoupling by both Chinese and US firms to reduce export control exposure (where feasible)
- More fracturing and restructuring of supply chains
- Retaliatory non-tariff measures by Beijing on US firms operating in China.

Re-shoring and ring-fencing

The other noteworthy event of May 2020, was that Washington persuaded TSMC to build a US\$12 billion state-of-the-art semiconductor fabrication plant in the US.³² This operation will have exclusive US buyers and will produce chips for American semiconductor clients such as Nvidia, Qualcomm, Advanced Micro Devices, Broadcom and other US companies which make up about 60% of TSMC’s revenue.

Chart VI – Top TSMC revenue by country



National security concerns will spur on-shoring into the US, the EU, Japan, and possibly Canada or Australia which, today, have small tech manufacturing footprints. Other countries such as Israel and Singapore could see an increase in re-shored and ringfenced industries.

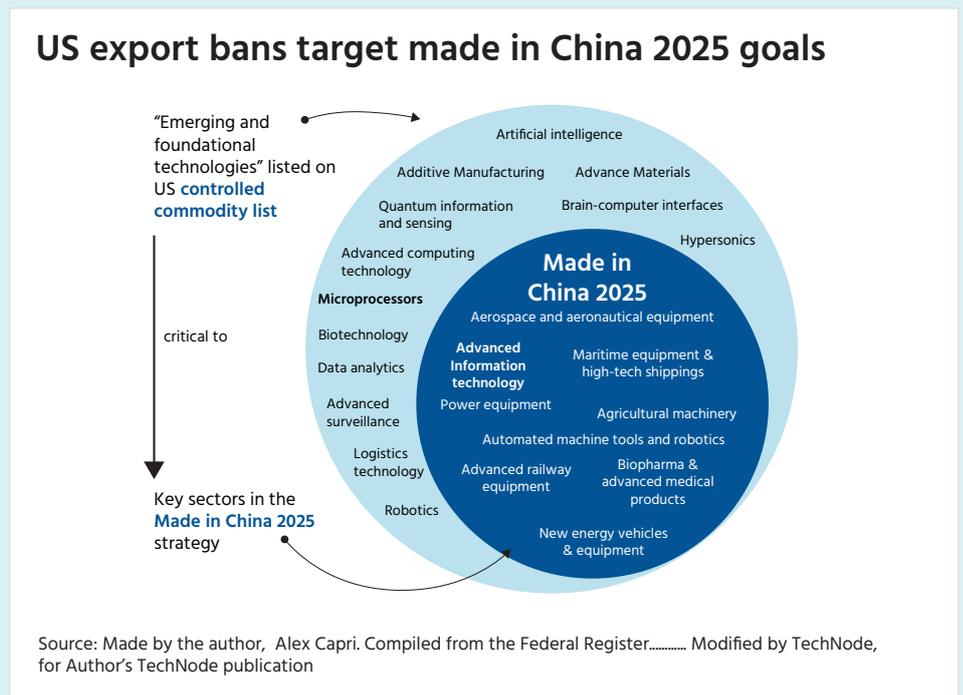
One of TSMC’s US clients, Xilinx, produces programable chips for the US Military’s F-35 Strike Fighter aircraft. Because Huawei has become TSMC’s fastest growing client, this has resulted in increased flows of business, people and technology between TSMC and Huawei’s HiSilicon subsidiary. This, in turn, has fuelled fears that Chinese state-actors are infiltrating TSMC to sabotage or otherwise compromise US-bound chips — or at the very least, are stealing critical IP and technology.³³

Thus, TSMC will set a precedent for building locally ring-fenced supply chain and manufacturing operations, based on geopolitical and techno-nationalist criteria. National security concerns regarding semiconductors and other technology will become the catalyst for a wave of re-shoring into the US, the EU, Japan, and possibly even into countries like Canada or Australia – which have small tech manufacturing footprints. Other countries such as Israel and Singapore could see an increase in re-shored and ringfenced industries.

Other industries will see increased pressure to re-shore and ring-fence if they trade in any “Dual Use” technology on the US Commerce or Wassenaar Arrangement control lists – which could apply to virtually everything on the Made in China 2025 initiative, including all emerging and foundation technologies for the industries of the future. Some of these technologies include:

- Drones
- Autonomous vehicles
- Quantum computing
- Advanced surveillance technology
- Hypersonics
- Additive manufacturing (3D printing)
- Biotechnology
- Brain-computer interface technologies
- Navigation.

Chart VII – US export controls and MIC 2025



III. The China conundrum: Navigating an uncertain landscape

MNEs will need to execute an “in-China-for-China” strategy, while simultaneously managing increasingly fragmented and localized value chains elsewhere.

MNEs are decoupling from China to mitigate risks related to an escalating US-China trade war. The weaponization of supply chains will see an increase in export controls and restrictions.

MNEs doing business in China will need to gauge how Beijing might respond to US efforts aimed at cutting-off the supply of technology to Chinese companies.

For the world’s technology companies, China presents a conundrum: how to protect existing and potential revenue streams in a massive market, while simultaneously dealing with increased techno-nationalist dangers – emanating from both state and non-state actors.

In-China-for-China

To participate in the China market, companies will require an “in-China-for-China” approach for doing business, even while they must orient themselves towards increasingly fragmented and localized value chains elsewhere.

Take for example Apple, which despite the current atmosphere of decoupling, announced it was deepening its supply chains in China through a partnership with the Chinese company Luxshare-ICT to make casings for the iPhone.³⁴ While this move was aimed at reducing reliance on Foxconn, Apple’s largest contract manufacturer – and reducing costs – Apple was also keen to further embed itself in the Chinese market and achieve better “localized” access to 1.3 billion potential consumers.

Yet even as Apple was announcing its local China strategy with Luxshare, it was in discussions with Indian officials, exploring the possibility of shifting nearly a fifth of its production capacity from China to India and scaling up its local manufacturing revenues through its contract manufacturers, Foxconn and Wistron, to around US\$40 billion over the next five years.³⁵ Just US\$1.5 billion worth of phones will be for the Indian market, the rest will be for export.

This move, which follows other supply chain shifts out of China – such as moving about 30% of AirPods manufacturing into Vietnam – is part of a wider plan to mitigate the risks of an escalating US-China trade war. It is a way to avoid the weaponization of supply chains, which will see an increase in export controls and restrictions.³⁶ Thus, China decoupling will occur alongside specific in-China-for-China strategies, for Apple and other MNEs.

China’s retaliatory actions

Accurately gauging how Beijing will respond to Washington’s efforts to cut off the supply of technology to Chinese companies will be become essential for US and other foreign companies doing business in China.

As a retaliatory measure, Beijing has already announced it will roll out an “unreliable entity” list which could include companies like Cisco, Qualcomm and Apple.

Presumed actions to be taken against blacklisted companies include:

- Investigations
- Audits
- Restrictions of local sales and operations
- Revocations of licenses
- Lawsuits
- Increased cyber-intrusions.

This kind of retaliatory scenario played out in 2018, after Micron, an American company, filed a civil lawsuit in the US against UMC, a Taiwanese

MNEs will face an increasingly hostile environment, particularly if they are seen to be complicit with US export controls and restrictions targeting Chinese firms. Techno-nationalist support to their Chinese competitors will increase, challenging their market share.

Companies in strategic industries like semiconductors will face a more complex situation. Beijing is actively funding efforts to expedite US technology decoupling by either replacing US-made with China-made tech, or switching to non-US suppliers.

Tech companies supplying China from Japan, South Korea, the EU or Taiwan will also face increasing pressure from both Washington and Beijing.

semiconductor company, for infringing its patent and passing technology on to Fujian Jinhua, a Chinese microchip manufacturer.³⁷

As a result of the lawsuit, the US government placed Fujian Jinhua on a restricted entity list. Subsequently, a Chinese court issued an order banning sales of Micron chips in China on the grounds of “patent infringement” of Fujian Jinhua’s technology.³⁸

Going forward, US and other foreign companies doing business in China should expect an increasingly hostile environment, particularly if they are seen to be complying with or complicit with US export controls and restrictions targeting Chinese firms. They should also expect a surge in techno-nationalist support from the Chinese state for local competitors looking to challenge their market share.

Accelerated decoupling of strategic supply chains

Other companies in strategic industries like semiconductors, are facing a more complicated conundrum.

For American semiconductor companies, Washington’s ongoing techno-nationalist campaign against China has already created a point of no return. They have already lost revenue and market share because of ongoing US export restrictions and, as soon as Huawei and other Chinese companies figure out how to replace American technology, they will do so.

That timeline could be delayed, for example, as US companies lobby the US government to delay or walk-back implementation of the direct foreign product rule and other restrictions, but both Chinese companies and the CCP are fully committed to de-Americanizing their tech value chains.

Beijing is actively funding efforts to either expedite US technology decoupling or crisis manage worst case scenarios, with the following priorities:

- Replacing US technology with Chinese made tech
- Switching to non-US suppliers when no Chinese alternative is available
- Where no alternative to US technology is available, leveraging the US political system via lobbyists and third parties to roll back or delay restrictions.

China’s strategy of switching to replacement suppliers from Japan, South Korea, the EU or Taiwan means companies and governments from these states will face increasing pressure from both Washington and Beijing.

US-China techno-nationalist decoupling will affect the US tech sector profoundly. Qualcomm, for example, derives approximately 65% of its revenue from China. Broadcom, Micron and Marvell Technology all receive over 50%, while almost all major US tech firms from Intel to Texas instruments, derive approximately 20% to 40% of global revenues from China.

Chart VIII – Companies with high revenue exposure in China

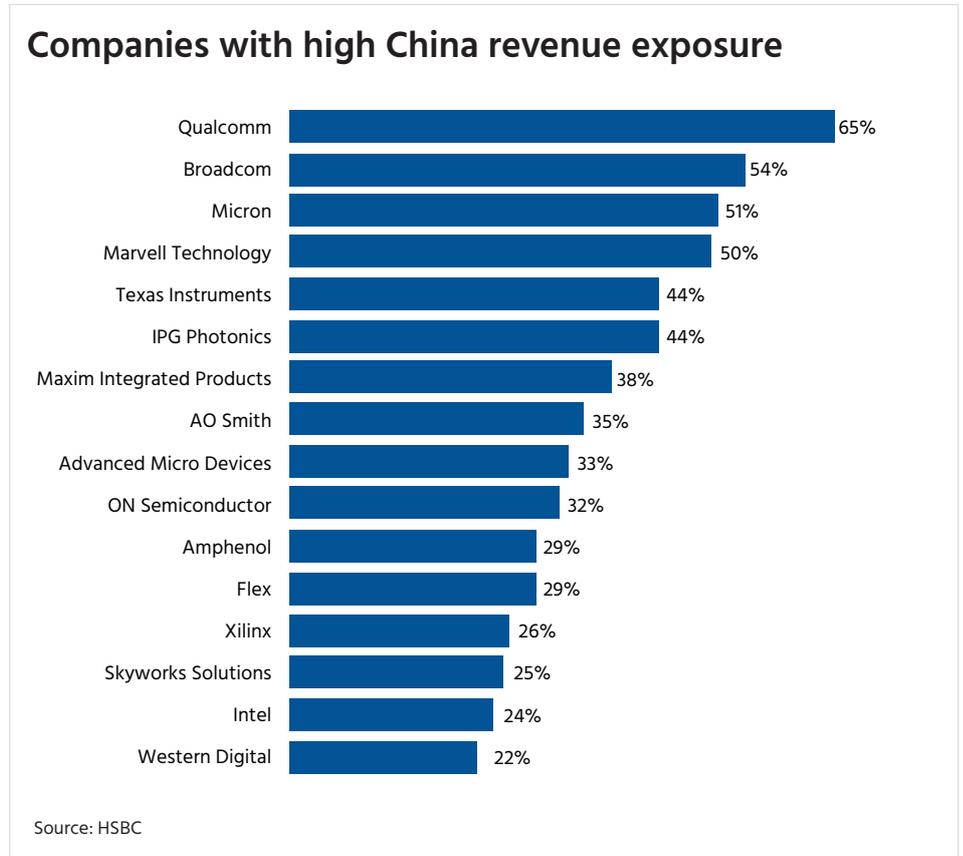
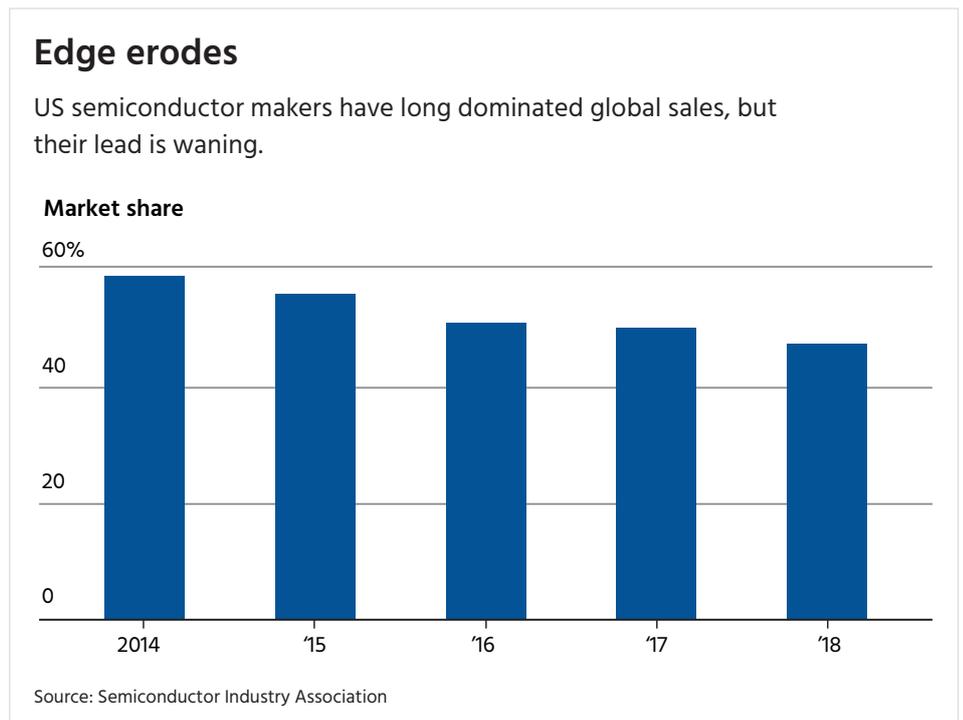


Chart IX – US semiconductor market share declines



Tech companies will need to map out a strategy to navigate this complex and fast evolving landscape.

These heavily effected companies will need to map a future that navigates both a tenuous in-China-for-China techno-nationalist landscape, as well as one that focuses on next generation innovation and markets.

Emerging partnerships and alliances

Export controls, restricted entity lists and the weaponization of supply chains will not fix the long-term challenges facing American and foreign technology companies trying to compete with the Chinese system and its firms.

The conundrum facing, for example, the US semiconductor sector is how to retain market share and a revenue base in China in the short term, while

figuring out how to maintain its technological lead in the medium to long term, at a time when Beijing is working feverishly to supplant them with local firms. How can this be done?

The answer lies in the next phase of techno-nationalism, which will feature the emergence of new public-private partnerships and alliances around R&D and manufacturing. These will be largely embraced by private stakeholders as long as they evolve in a way that does not stifle market incentives. It may also involve turning to new products for new markets, other than China.

This will be the topic of the next essay in the series.

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Alex Capri is a research fellow at the Hinrich Foundation and a senior fellow and lecturer in the Business School at the National University of Singapore. He also teaches at the NUS Lee Kuan Yew School of Public Policy.

From 2007-2012, Alex was the Partner and Regional Leader of KPMG's International Trade & Customs Practice in Asia Pacific, based in Hong Kong. Alex has over 20 years of experience in global value chains, business and international trade – both as an academic and a professional consultant.

He has advised clients on cross-border projects in more than 40 countries and he has worked in some of the most challenging regulatory environments in the world.

He advises governments and businesses on matters involving trade and global value chains. Areas of focus include: IT solutions for traceable supply chains, sanctions, export controls, FTAs and trade optimization.

Alex has been a panelist and workshop leader for the World Economic Forum. He writes a column for Forbes Asia, the Nikkei Asian Review and other publications and is a frequent guest on global television and radio networks. He holds a M.Sc. from the London School of Economics, in International Political Economy. He holds a B.Sc. in International Relations, from the University of Southern California.



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