

# US-China Technology War

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US President Donald Trump has declared commercial war on China since he has entered the White House, on the grounds that China is “raping” the USA with its trade policies. It is true that trade relationships between the 2 countries are asymmetric and unfair to the US, but is their \$400 billion trade deficit the only reason behind the US pressure? In my view, it is a smoke shell hiding the two 21st century’s superpowers’ fight for leadership, not only in technology, but also for economic and financial control. Let’s go further and see, for each area, how things look like. We start first with technological confrontation. China aims at becoming a tech superpower and focuses on its plan to achieve this goal. Let’s see how they plan to achieve it.

*“In the past, we tightened our belts, gritted our teeth and built the two bombs and a satellite.”; “In the next step of tackling technology, we must cast aside illusions and rely on ourselves.”* – Xi Jinping, China Communist Party Secretary General.

## Developing a World-Class Research

### ○ *“Develop It Yourself”*

That’s what Beijing has been trying to do for two years now with its “Made in China 2025” program, which sets up ambitious objectives in 10 key future industries (autonomous vehicles, robotics, biomedicine, genomics, etc.), and lays the groundwork to achieve them.

The United States bet on *libre entreprise* and private-led initiatives to foster innovation. Not denying the proven efficiency of private-led initiatives, China has come up with a “hybrid” strategy: a mix state-backed projects along collaboration with the private sector.

Beijing’s efforts aimed at achieving technological mastery in tomorrow’s new tech industries focus on 2 parts: public initiatives and collaboration with the private sector.

### ○ *Public Initiatives*

#### 1. *Made in China 2025, the program.*

The goals are (i) Cut China’s current dependency on Western technology, notably on imports of highly-specific tech components from the West (such as semiconductors); (ii) Build national champions and empower them so that they can rival globally with their Western counterparts. Over a longer horizon, the main goal is clearly to uplift China from a low-cost manufacturer to a direct competitor of nations like South Korea, Japan, and Germany.

For the first goal, an effective way is to accumulate as much Intellectual Property (IP) as possible. This can be achieved through either appropriating property of new inventions - notably, Chinese Universities, in hiring renowned foreign professors, assuring some

portion of the rights on their inventions return to the University's property, or by buying it. We are currently witnessing a wave of patents' purchases or buyouts by Chinese firms.

For the second goal China can count on deep-pocket dedicated state funds such as the National Integrated Circuit fund with an initial endowment equivalent to \$21 billion US dollars. This fund is in many ways similar to a Venture Capital fund and directly has access to firms' claims for project development. China is also involving its own state banks in the process, by reorienting their credits efforts towards the 10 key targeted industries, whether directly through subsidies, or indirectly through 0-interest rate loans and backing of bonds issuance.

What strikes one's mind in the first official version of the plan is a paragraph, that includes dates and percentage of replacing foreign companies in the domestic market and then expanding them globally.

One can find these specifications of the ambitious targets set up by the Communist Party on two topics: (1) Domestic market share: must meet level requirements. (2) Independence over foreign tech: rising domestic produced content of core components to 40% by 2020 and 70% by 2025 (vs. only 0-to-30% today).

Also, China is striving to build a Silicon Valley environment to supplement these efforts. Tech hubs are popping up. Zhangjaang Hi-Tech Park in Shanghai, with 110 research and development institutions, 3600 companies (e.g., Huawei) and over 100,000 workers are considered by many as China's equivalent of the US Silicon Valley.

Chinese tech hubs consist partially in replicating the US model for innovation: bringing together prestigious universities, some of the world's best minds in key fields and making sure to create an innovation-friendly environment, by adjusting notable regulations.

### *2. Thousand Talents Program*

The best way to devise tomorrow's milestone innovations is to gather the best brains to work for you. That's exactly what the "Thousand Talents Program aims at. China is ready to oversee some of its communist principles by spending generous amounts of money to its Thousand Talents program. Along with a \$144,000 "welcome package", scientists and scholars agreeing to leave their sweet home for China tech hubs are guaranteed with school places for their children and job for their wife.

- *Collaboration with the private sector*

State-pushed programs themselves won't uplift China to tech mastery. In capitalism, innovation's most powerful driver remains greed and, in our today advanced times, new breakthroughs in science require massive investments over a long, tedious R&D process. That's why Beijing has been working on joint projects with private companies for some years now. Alibaba, Tencent and Baidu all have worked with the state. Furthermore, Beijing doesn't hesitate in pouring money into what it perceives as China's best horses to bet on in the tech industries. Huawei, notably in this case, is said by the Americans to have benefited from a great deal of state funding in its efforts for developing 5G, a key and decisive technology to put a patent on as many of tomorrow's commercial applications of today's inventions require 5G. Indeed, the existing 4G is not able to guide autonomous vehicles or support virtual reality machines.

- *Semiconductor: the crux of the war.*

*Figure 1: Huawei's promotion of 5G technology at the Mobile World Congress 2019 in Barcelona, Spain*



Among \$300 billion dollars committed to the “Made in China 2025” plan over 10 years; the Research group Gavekal estimates \$150 billion of the total amount is devoted to the semiconductor industry funding.

Because of its crucial importance in manufacturing many of today and tomorrow’s innovations (e.g., robotics, biotechnologies), the sector has received particular attention from the state. Semiconductor Manufacturing International Corporation (SMIC), currently the largest and most advanced semiconductors in China, has been enjoying state support over the last decade. Headquartered in Shanghai, it represents Beijing boldest bet to cut the country’s dependency on imports of western-manufactured semiconductors.

- *The results for now*

Beijing’s efforts to achieve global leadership in various technological sectors by 2025 are contrasted. On the one hand, there are already tangible and existing examples of China’s mastering tomorrow’s technologies: Huawei is at the forefront in 5G technology, and well on its way to become the first company ever to master 5G. In Artificial Intelligence, Tencent has made significant progress in a number of prone-to-AI applications fields, whether being its autonomous vehicles or healthcare. Its most astonishing feat still lies in machine learning, where the company is credited with dozens of leading technologies in image, face, and speech recognition. China is now able to build high-speed railways as performant as the European and Japanese and is using the One Belt One Road Initiative to spread it across the emerging countries.

On the other hand, overall, China is still years behind the West. It’s interesting to have a look at the Top 15 semiconductors sales leader in the world in 2018: only one is Chinese – although only half Chinese: TSMC, based in Taiwan (see Figure 2).

In the semiconductor field, analysts converged to say its efforts aren’t paying off that much for now, SMIC, the country’s most advanced Chinese company in this field is still “a decade behind its international rivals”.

- *“From developing it to hijacking it”*

Betting only on internal efforts to develop a world-class innovation will likely prove to be insufficient to achieve the “Made in China 2025” plan’s objectives as it takes times before billions pumped into Research and Development and then transforms into landmark decisive innovations. Instead of betting all your pennies on waiting quietly for your investment in a haphazard R&D to produce uncertain results, you should better take shortcuts and draw innovation directly to its source: in the Westerners blood. This part of Beijing strategy, what Robert Atkinson describes as a “by-hook-or-by-crook strategy”, aiming at achieving tech leadership. If Western technology can’t be acquired, then we must resort to exceptional means.

## Getting Access to Western Technology

Three ways to get access to Western technology:

- By directly acquiring it. Chinese acquisitions of business overseas (through M&A deals) hit a new dimension in the past two years. Dealogic, a company offering services

Figure 2: 2018F Top 15 Semiconductor Sales Leaders (\$M, Including Foundries)

2018F Top 15 Semiconductor Sales Leaders (\$M, Including Foundries)						
2018F Rank	2017 Rank	Company	Headquarters	2017 Total Semi Sales (\$M)	2018F Total Semi Sales (\$M)	2018F/ % Cha
1	1	Samsung	South Korea	65,882	83,258	263
2	2	Intel	U.S.	61,720	70,154	143
3	4	SK Hynix	South Korea	26,722	37,731	413
4	3	TSMC (1)	Taiwan	32,163	34,209	6%
5	5	Micron	U.S.	23,920	31,806	333
6	6	Broadcom Ltd. (2)	U.S.	17,795	18,455	4%
7	7	Qualcomm (2)	U.S.	17,029	16,481	-3%
8	9	Toshiba/Toshiba Memory	Japan	13,333	15,407	163
9	8	TI	U.S.	13,910	14,962	8%
10	10	Nvidia (2)	U.S.	9,402	12,896	373
11	12	ST	Europe	8,313	9,639	163
12	15	WD/SanDisk	U.S.	7,840	9,480	213
13	11	NXP	Europe	9,256	9,394	1%
14	13	Infineon	Europe	8,126	9,246	143
15	14	Sony	Japan	7,891	8,042	2%
Top-15 Total				325,302	381,160	183

(1) Foundry (2) Fabless  
Source: Company reports, IC Insights’ Strategic Reviews database

Source: McClean Report – IC Insights

to financial firms, calculated that over the past two years alone, China spent more than \$ 110 billion worth of tech M&A deals

- Indirectly, through (forced) transfer of technology from Western Companies in exchange of access to the Chinese market. Indeed, for Western companies to enter its market, Beijing requires them to form a joint-venture with a domestic counterpart as to share their know-how.
- By stealing it. How? Well, the best way still remains to use a Trojan's Horse. It can be a company - Huawei recently - enjoying their foothold on Western markets to get access to sensitive technology. - see Huawei CFO's arrest. Or it can be a person directly, like a set of hot-shot professors - whether they are Chinese or not, it doesn't matter - within prestigious US universities, having extensive access to the University Research labs and able to share with you the latest discoveries in a given field. If none of the methods quoted above are available to you then I recommend you use cyber-attacks, which, to be said, have set a record of efficiency last year rarely equalled in Intellectual Property (IP) theft history.

## The West Reaction

It's funny to note that, since the Communist Party of China ordered it, Chinese medias no longer refer to the term "Made in China 2025". This is because the Party understood that the greater the perceived threat by the US, the more the US fears for their tech supremacy and, as a result, the more hawkish they will be in dealing with Chinese tech companies. At least for now, keeping access to the US market and US-manufactured tech core components remains vital to China.

Chinese investors doing shopping in Europe and in the US has sparked fears among the EU and US regulators for national sovereignty concerns. Acquisitions of Western tech companies by Chinese ones are now under particular scrutiny from EU and US regulators. Both have already thwarted several attempts of Chinese investors' buyouts of domestic companies. Among the most stirring ones are:

- The US Committee for Foreign Investment (Cfius) already blocked several M&A deals, notably a \$3 billion Chinese consortium offer for a US-based lighting unit of Philips
- Brussels blocked the €670 million sale of German chip equipment maker Aixtron to Chinese investors

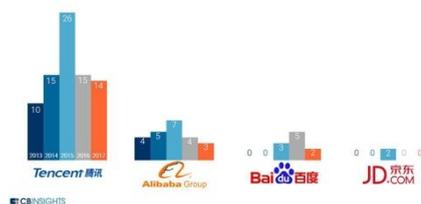
It seems, from figures compiled by CBIInsights, that regulators' efforts to cut China's appetite for western tech companies are paying off: the number of tech M&A deals performed by Chinese companies have been on the downward trend for the past three years (see figure 3).

But the US, after almost a year, are now resorting to more straightforward measures to stop IP theft. In April 2018, the US department of Justice banned ZTE Corp., a Chinese telecoms company, from buying Americans semiconductors and other technologies for seven years. In addition, last month, US lawmakers introduced bills that would ban the sales of US components to Huawei.

The US also decided to use commercial litigations to stop IP theft. Over the last year they have repeatedly waved 25% tariffs to be imposed on several hundred billion of Chinese imports, should Beijing not give in to Washington requests that forced transfer

*Figure 3: Chinese Tech Giants Pursue fewer US Investments*

Chinese tech giants pursue fewer US investments  
Total deals to private US-based tech companies (2013 - 2017)



of technology in exchange of access to the market be abolished. Indeed today, for a Western company to enter the Chinese market it necessarily needs to set up a joint-venture with its Chinese counterpart.

Being aware that these measures won't be enough to stop China's appetite for western tech companies, US regulators came up with a more "hawkish" policy to stem technology transfer to China: controls over US exports of sensitive technologies. The last time such a measure was implemented is in the UK during the 19th century to prevent emerging French manufacturers from appropriating UK's technology and from catching up. The French retaliated this by offering asylum to British inventors accepting to leave their home country for France, in exchange for their weight in gold. That's similar to what Beijing is doing now, with its \$144,000 welcome package to any renowned researches willing to leave and set up in some of China's tech hubs to pursue their Research.

## China's Achille Heel

China's main weakness is its dependence on Western technology, whether it be semiconductors or other components crucial to building future technologies. As of today, China is still relying on the US and European firms to provide it with those components. For instance, in the aerospace industry (one of the 10 key industries identified by China 2025 plan), Chinese manufacturers of satellites are extremely dependent on Americans, Europeans and Russians. Should the latter decide overnight to stop providing China with the needed pieces, then China's efforts to conquer technological dominance would be ruined. But what is the purpose of this technology dominance?

*Beyond technology: fighting for global hegemony*

What is at stake here goes far beyond mere national sovereignty concerns; it is about securing leadership - or "monopoly rent" - in some of the future, most profitable industries such as IT technologies from US firms the last two decades (e.g., Apple, which regularly exhibited some 40% net operating profit margin). Thus, technology may be the means, but the goal is clearly to achieve economic hegemony.

## Conclusion

There is reason to be confident – or afraid, depending upon your point of view - in China's ability to achieve its goals in the technology sector. Indeed, at multiple occasions in the past, the country showed its capacity to uplift – combining state-pushed and private initiatives – at an unprecedented speed its technological level. The following figures can't be more indicative of China's potential: In 2017, Chinese telecoms companies such as Huawei, Oppo and Vivo accounted for 43 per cent of global smartphone sales, eclipsing Apple and Samsung.

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