

DISCUSSION PAPER



Global Tech War is Escalating: Is Victory within Reach?

Şeymanur Yönt

TRT WORLD
research
centre

Global Tech War is Escalating: Is Victory within Reach?

Şeymanur Yönt

© TRT WORLD RESEARCH CENTRE

ALL RIGHTS RESERVED

WRITTEN BY

Şeymanur Yönt

PUBLISHER

TRT WORLD RESEARCH CENTRE

June 2023

TRT WORLD İSTANBUL

AHMET ADNAN SAYGUN STREET NO:83 34347

ULUS, BEŞİKTAŞ

İSTANBUL / TÜRKİYE

TRT WORLD LONDON

PORTLAND HOUSE

4 GREAT PORTLAND STREET NO:4

LONDON / UNITED KINGDOM

TRT WORLD WASHINGTON D.C.

1819 L STREET NW SUITE 700 20036

WASHINGTON DC

www.trtworld.com

researchcentre.trtworld.com

The opinions expressed in this discussion paper represent the views of the author(s) and do not necessarily reflect the views of the TRT World Research Centre.

Introduction

The tech industry is, once again, a battlefield. Technological developments, the prevalence of dual-use technologies, the power of data, and the weaponisation of interdependencies are all ammunition fueling this war. More importantly, the rise of China, especially with its Made in China 2025 policy and the change in the meaning of national security, ignited this front that once decisively impacted the global contest against formidable foes, such as the USSR and Japan.

The main warring sides in today's tech war are the US and China. Both aim to protect their national security and become tomorrow's leaders. For Washington, the main goal is to achieve tech breakthroughs while preventing Beijing's advancement in this field via economic coercion. China's strategy is the reverse: Circumventing US attempts to slow down its technological self-sufficiency while delivering some quantum leaps.

Considering the recent developments, neither party can claim a victory any time soon. Aggressive measures adopted in the short term, i.e., in 2-3 years, affect supply chains, create uncertainty, and result in retaliatory actions. Thus, the direct cost of such measures for countries' own industries is high.

In the long run, victory is theoretically possible if the emerging victor increases R&D funding and becomes self-sufficient. Even then, retaliatory measures should be removed and collaboration should be increased. Such steps are necessary to reduce incurred damages and stabilise the tech domain by adopting clear and consistent policies.

This discussion paper explores the contours of the tech war involving the US and China while examining the prospects for short-term and long-term victory.



(Walid Berrazeg - Anadolu Agency)

The Tech Industry: A Favoured Battlefield

From World War II to Strategic Defence Initiative, the tech industry has always been a favoured battlefield. While dominance in the tech domain does not necessarily translate into a military victory and economic supremacy, it significantly impacts these facets. For example, the US taking the lead in nuclear technology of the US has led to the atomic bombings of Hiroshima and Nagasaki, which, in turn, hastened the end of World War II.

In addition, economic growth, especially in industrial countries, was attributed by economists to technological innovation (Rosenberg, 2004, p. 1). Many economists discovered that the major fraction of the US per capita growth was due to the productivity that increased with technical change, whereas an increase in capital and labour input had a limited impact on growth (Abramovitz, 1989, p. 14). Advancement in tech, therefore, became top of the agenda for leading nations, especially when their national security is concerned. For instance, since the 1950s, the US has relied on its technological supremacy as a crucial component of national security (Lange, 2016). Therefore, US Export Administration Regulations and the heightened controls on chip exports and similar technologies aim to maintain that edge.

Today, the tech war between the US and China is no different. While their contest revolves around the semiconductor industry, the end goal is to claim victory and achieve world dominance.

Victory for the US means advancing technology in collaboration with like-minded allies and preventing strategic competitors' exploitation of the US and its allies' technologies (The White House, 2022a, pp. 32 – 34). As such, the US recently enacted the CHIPS and Science Act of 2022 and granted \$52.7 billion for semiconductor production, workforce, and R&D (The White House, 2022b). In addition, Washington is considering outbound investment screening in sensitive technologies, as signalled by US National Security Adviser Jake Sullivan (Sullivan, 2023). Moreover, to increase the effectiveness of its measures, the White House convinced the Netherlands and Japan, which have high stakes in the tech sector, to join the US to curb the chip technology exported to China (Swanson, 2023).

Conversely, with Made in China 2025 Program, China aspires to reduce its dependence on imports of foreign technology (Institute for Security & Development Policy, 2018) and increasing its self-sufficiency to ensure its national security (PRC State Council, 2015).

What are the Odds for a Victory?

The US and China outbid each other for export controls and subsidies in the military sector and other domains, such as chips, electric vehicles, and consumer products. The tech war is likely to escalate aggressively.

China and the US know how important a role tech has started to play in military affairs, intelligence gathering, and economic growth.

Recently, the US started realising it is losing its technological edge to China. The US government faces limited choices in its strategy because it has lost close ties with the private sector. During 1960s, the US was the main lead behind the tech sector. Its priorities determined the areas of improvement. Whereas, starting with 2000s, the private sector priorities overshadowed the US national priorities. Now, the private sector in the US is mainly driven by profit-

seeking, not by the US concerns. Meanwhile, the Chinese economic framework allows China to maintain close ties with the private sector and use the latter to pursue its strategic goals. As a result, aggressive and comprehensive policies become unavoidable and important for determining the chances for victory.

1. Short-term victory: Highly unlikely

Although the tech contest involves increasingly aggressive and comprehensive policies, neither party can claim a victory within 2 – 3 years. In March 2023, the US Department of Commerce announced national security guardrails to prevent "adversarial countries" use of chips for harmful purposes (The US Department of Commerce,

2023). In May 2023, China banned Micron Technology, a US memory chips maker, products from being used in key national infrastructure operations (Olcott & Sevastopulo, 2023). Beijing claims Micron Technology's products pose serious potential network security issues (Cyberspace Administration of China, 2023). Recent patterns show that both parties prioritise export controls as the preferred war method, at least in the short term. The G-7 members' Communique of 2023 confirms this practice, stating that "export controls are fundamental policy tools" for addressing the issues brought about by the divergence of technology essential for military uses (G-7, 2023). In addition, the G-7 Communique notes the significance of "cooperation on export controls on critical and emerging technologies" for addressing their misuse (G-7, 2023). Such verbiage indicates that attacks from both sides will increase, and export controls will be a popular attack method, at least in the short term.

Export controls, a popular method of tech warfare with momentous impact, are increasingly utilised to prevent intellectual property theft and protect sensitive technologies from falling into the hands of potential adversary countries. To this end, Washington maintains strict controls on the export of encryption technologies. As such, export controls also buy time for countries by slowing their enemies' tech advancement progress. Such precious time allows for subsidies and investments to bear fruit.

Moreover, export controls cripple the targeted countries' tech industries and give the imposing country a competitive advantage. Because affected companies either lose access to a market or the equipment necessary for their manufacturing. As a result, they became compelled to re-establish their business plans and re-route their supply chains, which is costly and time-consuming.

For example, Huawei and ZTE, leading Chinese tech companies' financial outlooks, have suffered significantly due to US technology export controls that targeted them (Allen et al., 2022). Similarly, following China's ban, Micron Technology's CFO estimated the effect on its business "between low single digits per cent of total revenue, or high single digits at the high end" (Sharwood, 2023).

However, export controls and similar measures carry significant risks that overshadow short-term victory. First, these measures also impact the tech industry of the export control-imposing country as the companies located in the control-imposing country lose access to the target country's markets. Jensen Huang, the CEO of NVIDIA, whose stock skyrocketed by 24% on May 25, stated that, because of the US export controls, NVIDIA is having trouble selling cutting-

edge semiconductors in one of the company's major markets (Murgia et al., 2023), i.e., China. Huang also warned that the inability to trade with China due to the escalating battle over chips would cause "enormous damage to American companies" (Murgia et al., 2023). Moreover, uncertainty around the possible export controls and lack of clarity about their implementation causes further business apprehension. Uncertainty prevents them from continuing their business as usual and leads to immediate profit loss, complicating compliance. Businesses invest in personnel to overcome such complications, and with the fear of non-compliance, they usually over-comply. In the end, companies' spending increases. All these measures naturally slow down a country's tech advancement, increasing existing costs and, thus, leading the imposing side to achieve short-term victory.

The significant risk, however, lies in the fact that imposing export controls causes a spiral of retaliatory actions. For example, China's ban on Micron Technology came just after the G-7 Communique. On the face of it, Micron Technology produces memory chips that can be easily replaceable. Their ban would not seriously hit the Chinese industry, which proves that the Chinese action was a retaliation.

Moreover, the US and China are not the only countries participating in this round of escalation. For instance, the EU Parliament is currently developing national export controls akin to the United States, introducing new Foreign Direct Investment screening regulations, and expanding its dual-use export control regulation framework to include catch-all controls for emerging technologies and cyber surveillance (Pacific Forum and Institute of International Relations & National Chengchi University, 2022). As a result of such retaliatory actions, all the disadvantages of export controls, which outweigh their advantages, quickly accumulate. For example, partly because of the retaliation, compared to the last quarter of 2022, global semiconductor sales decreased by almost 10% in the first quarter of 2023 (Semiconductor Industry Association, 2023).

Worse, countries easily fall into the trap of passing the line of what is necessary for advancing in tech to ensure national security and economic prosperity. Instead of carefully designed policies, China and the US seem more inclined to adopt fast, over-expansive, and ambiguous measures. For example, the policies concerning sensitive technologies go beyond what is necessary. Restrictions on drone swarms provide the expected benefits. Whereas restrictions around social media platforms and consumer devices like smartphones are counterproductive (Bateman, 2022, p. 122). Moreover, because of such inclination, China and the US do not give themselves time to wait

and see the outcomes of such measures before imposing more measures. That makes such export controls more unproductive and reduces the chances of a victory.

More aggressive methods and tit-for-tat actions mean no one can claim victory in the short term. The methods adopted produce immediate effects (e.g., export controls) and increase the cost for businesses by distorting supply chains, creating market uncertainty, and resulting in more retaliatory actions, which affect both sides.

That does not mean such measures provide some benefits for the countries, including buying some time for them before their incentives in the tech sector bear fruit. However, the scale of the retaliatory actions creates a zero-sum game in the end, poisoning the field for all concerned.

2. Long-Term Victory: Possible Under Certain Conditions

In this tech war, defensive measures such as export controls are not the only method countries adopt. Countries are increasingly leaning towards subsidising the tech industry and providing incentives to companies. For instance, the CHIPS and Science Act 2022 allocates \$52.7 billion for American semiconductor R&D and production (The White House, 2022b). On the other hand, China increased its investment in tech and science by 2 billion yuan (Baptista & Goh, 2023). Similarly, in February 2023, the Chinese "Big Fund" put around \$1.9 billion into YMTC in response to the US restrictions (Che & Liu, 2023).

Paradoxically, this tech war will bring some benefits in the long term. First, incentives, which work best in the long run, usually increase private R&D and innovation (Choi, 2022). Accordingly, innovation will increase, and this will help Chinese and US companies develop technologies that boost their national security and foster economic prosperity. Moreover, countries have become more sensitive towards supply chain resiliency and are now re-evaluating their business plans with an eye on sanctions. For example, just recently, on May 27, fourteen countries forming the Indo-Pacific Economic Framework (IPEF), including the US, concluded the negotiations on the IPEF Supply Chain Agreement (The US Department of Commerce, 2023). The Agreement aims to secure semiconductor supply chains by strengthening supply chain logistics, establishing information-sharing mechanisms, and improving supply chain transparency (Ministry of Foreign Affairs of Japan, 2023). In the long term, such efforts will prevent supply chain disruptions, increase self-sufficiency, and help avoid

the problems of weaponised tech interdependencies. Having more resilient and resistant supply chains, as well as self-sufficiency, will not only benefit businesses and countries but will also benefit consumers. Such positive developments will help both countries move closer to victory.

There are, however, many obstacles that may prevent countries from claiming victory in the long run. From Washington's perspective, Beijing provides significant incentives to Chinese businesses and the tech sector. This state of affairs prevents the US sanctions from reaching the desired outcome. Meanwhile, China has steadily increased its investments and incentives in its tech sector to become self-sufficient. China is racing against time to avoid being cut off from necessary equipment that manufactures tech products to avoid losing the tech war. Huawei's founder Ren Zhengfei, for example, claimed it has secured components' domestic supplies, redesigned circuit boards, and will launch its enterprise-source-planning to fill the gaps the American policy left behind (The Economist, 2023, p. 19).

This situation shows China's commitment to being self-reliant in science and technology. Affected Chinese firms will surely circumvent such measures. Consequently, accelerated Chinese self-sufficiency will undermine the US efforts to prevent China's tech advancement and, therefore, a US victory.

The regulations' ripple effect is another obstacle preventing both countries' victories. For instance, recent interventions and regulations in the US create additional regulatory complexities. Different US departments enact different policies with differing national security meanings in mind. These actions create complexities, and the possibility of further measures adds further uncertainty for the business community, making business in the US volatile and costly.

Therefore, unless there is a clearer and consistent industrial tech policy in the US, running a business in the US will be more expensive in the long term than in the short term. The same is also valid for China. Data localisation requirements and stronger personal data protection regulations increase businesses' expenses as they are required to navigate through all these regulations.

Moreover, for companies that want to enter the market, complex regulations create barriers to entry as businesses struggle to meet regulatory requirements. These are likely to reduce investments and limit competition. This reduction means less innovation and lesser technologies that may be used for ensuring national security and fostering economic growth.

Export controls and other policies limit scientists, engineers, researchers, and professionals from cooperating. Similarly, they limit resource pooling and slow down problem-solving. Less cooperation leads to countries' isolation in developing technologies, even totally preventing it. Reduced levels of collaboration slow innovation as different domains can no longer share their knowledge, insights, and experiences. These all mean double spending of money and time for developing similar technologies. As a result, countries waste their resources and time, and possible victory delays.

Meanwhile, the tech war paves the way for hasty tech subsidies without a clear purpose. Subsidising the tech industry without coordinated action and clear strategy can pour extra money unnecessarily into the industry. It also leads other entities to subsidise their industries in a tech war rife with retaliatory actions. For example, in April 2023, the EU, to prevent its businesses from falling behind in this tech war, reached a provisional political agreement to shift away from dependency and vulnerability in the chips sector (The Council of the EU, 2023). To this end, the Chips for Europe Initiative agreed to mobilise €43 billion for the sector (The Council of the EU, 2023). Similarly, on May 19, the UK announced its National Security Strategy and plan to invest up to £1 billion (The UK Department for Science, Innovation and Technology, 2023).

These amounts are substantial. Initially, there was less coordination and planned policy actions among the countries aligned with the US. This situation is changing. The G-7 Communique of 2023 emphasised collaboration. Similarly, the press release of the UK Department for Science, Innovation, and Technology highlighted strengthening "tech collaboration with like-minded economies" (The UK Department for Science, Innovation and Technology, 2023). In addition, the Joint Statement EU-

US Trade and Technology Council (May 31, 2023) stressed collaboration in many tech-related areas, including electric vehicles, critical mineral supplies, semiconductors, and quantum technologies (The European Commission, 2023).

Stressing collaboration is a good first step. However, unless such collaboration efforts become tangible, the race for subsidies risks creating double-ups and pouring the taxpayers' money on superfluous areas. The latter is a serious risk because bringing some areas to a certain level from the beginning is costlier than adopting other countries' advanced technologies. Nevertheless, countries searching for self-sufficiency and boosting their industries can lose sight of this point. Therefore, unless collaboration efforts solidly materialise, uncoordinated subsidies will not deliver the expected benefits and will jeopardise a long-term victory.

Moreover, recent developments show that finding a delicate balance between separation and interdependence for both countries will not happen soon. Both countries continue to adopt more vague and inconsistent policies. This environment prevents businesses from having some clarity about the market's future. The current tide also shows that collaboration and corporation between China and the US are not high on their agendas. Even though there are promising developments in this regard, such as a language shift from decoupling to de-risking, highlighting the importance of separation only when it decreases the risk, such developments remain new and unclear. Furthermore, spiralling retaliatory actions can get out of control and do more damage than good in the long-haul, which decreases expectations for a long-term victory. Therefore, unless current practices change, the chances for a possible victory in the long run for both the US and China seem unlikely.



European Commissioner for Europe fit for the Digital Age Margrethe Vestager speaks during a meeting on the Chips Act at EU headquarters in Brussels, on February 8, 2022. - The European Union announced a massive 48 billion US dollar plan to become a major microchip producer and wean itself off its dependency on Asian markets in the strategic sector that drives anything from cars to game consoles. (Dursun Aydemir - Anadolu Agency)

Conclusion

The global tech war, instigated by Washington and Beijing, is heating up. Both sides aspire to achieve victory. The US aims to advance in tech and prevent China's advancement and exploitation in the tech sector. China adopts a reverse policy, aiming to achieve self-sufficiency as soon as possible.

In search of ensuring their national security, both countries employ aggressive and comprehensive methods. Two of these methods, export controls and subsidies, have a decisive impact on the short-term and long-term. Export controls will enhance chances for a short-term win, whereas subsidies could ensure a long-term victory.

Export controls have benefits, such as preventing intellectual property theft, buying time for countries until their investments bear fruit, and damaging the target country's

businesses. However, export control's disadvantages outweigh its advantages. They have a recoil effect and, thus, negatively impact the imposing country's businesses. Moreover, controls create uncertainty in markets. Another significant risk is that export controls can easily go out of control. Subsidies also have some benefits, including increasing innovation, reducing supply chain distortions, and generating self-sufficiency. However, lack of cooperation among countries, regulations' spill over effect, and arbitrarily designed policies are disadvantageous and undermine the prospects of a long-term victory for either side.



President Joe Biden visits a Wolfspeed semiconductor manufacturing facility in Durham, North-Carolina to kick off the Investing in America Tour in Durham NC, United States on March 28, 2023. (Abdulnasser Alseddik - Anadolu Agency)

References

Abramovitz, M. (1989). Thinking about economic growth and other essays on economic growth and welfare. Cambridge University Press

Bateman, J. (2022). U.S.-China technological "decoupling": A strategy and policy framework. Carnegie Endowment for International Peace. <https://carnegieendowment.org/2022/04/25/u.s.-china-technological-decoupling-strategy-and-policy-framework-pub-86897>

Pacific Forum and Institute of International Relations & National Chengchi University. (2022, January 11-12). Sensitive technologies and strategic trade controls virtual workshop (Webex). <https://pacforum.org/events/sensitive-technologies-and-strategic-trade-controls>

PRC State Council. (2015, May 2015). Notice of the State Council on the publication of Made in China 2025 (Center for Security and Emerging Technology, Trans.). https://cset.georgetown.edu/wp-content/uploads/t0432_made_in_china_2025_EN.pdf

Rosenberg, N. (2004). Innovation and economic growth. OECD. <https://www.oecd.org/cfe/tourism/34267902.pdf>

The UK Department for Science, Innovation and Technology. (2023, May 19). New £1 billion strategy for UK's semiconductor sector [Press release]. <https://www.gov.uk/government/news/new-1-billion-strategy-for-uks-semiconductor-sector>

The Economist. (2023, April 1-7). A daunting arsenal. The Economist Weekly Edition: America v China. <https://www.economist.com/briefing/2023/03/30/americas-commercial-sanctions-on-china-could-get-much-worse>

Lange, K. (2016, March 31). 3rd Offset Strategy 101: What it is, what the tech focuses are. CHIPS. <https://www.doncio.navy.mil/chips/ArticleDetails.aspx?ID=7673>

Institute for Security & Development Policy. (2018, June). Made in China 2025 backgrounder. <https://isdpeu.content/uploads/2018/06/Made-in-China-Backgrounder.pdf>

Choi, J. (2022, August). Do Government Incentives to Promote R&D Increase Private R&D Investment? World Bank Research Observer, 37(2), 204-208. <https://doi.org/10.1093/wbro/lkac004>

Allen, G. C., Benson, E., & Reinsch, W. A. (2022, November 30). Improved Export Controls Enforcement Technology Needed for U.S. National Security. Center for Strategic and International Studies. <https://www.csis.org/analysis/improved-export-controls-enforcement-technology-needed-us-national-security>

Swanson, A. (2023, January 28). Netherlands and Japan Said to Join U.S. in Curbing Chip Technology Sent to China. The New York Times. <https://www.nytimes.com/2023/01/28/business/economy/netherlands-japan-china-chips.html>

Baptista, E. & Goh, B. (2023, March 5). China to double down on push to be self-reliant in tech, premier says. Reuters. <https://www.reuters.com/world/china/china-stresses-need-tech-reliance-firms-should-lead-innovation-2023-03-05/>

The US Department of Commerce. (2023, March 21). Commerce Department Outlines Proposed National Security Guardrails for CHIPS for America Incentives Program [Press release]. <https://www.commerce.gov/news/press-releases/2023/03/commerce-department-outlines-proposed-national-security-guardrails>

The Council of the EU. (2023, April 18). Chips Act: Council and European Parliament strike provisional deal [Press release]. <https://www.consilium.europa.eu/en/press/press-releases/2023/04/18/chips-act-council-and-european-parliament-strike-provisional-deal/>

Sullivan, J. (2023, April 27). The Biden administration's international economic agenda: A conversation with National Security Advisor Jake Sullivan. Brookings Institution. https://www.brookings.edu/events/the-biden-administrations-international-economic-agenda-a-conversation-with-national-security-advisor-jake-sullivan/?utm_campaign=Events%3A%20Economic%20Studies&utm_medium=email&utm_content=256040036&utm_source=hs_email

Semiconductor Industry Association. (2023, May 1). Global semiconductor sales decrease 8.7% in first quarter; march sales tick up month-to-month for first time since May 2022. Semiconductor Industry Association. <https://www.semiconductors.org/global-semiconductor-sales-decrease-8-7-in-first-quarter-march-sales-tick-up-month-to-month-for-first-time-since-may-2022/#:~:text=by%20Semiconductor%20Industry%20Association,the%20first%20quarter%20of%202022>

Che, C. & Liu, J. (2023, May 11). 'De-Americanize': How China is Remaking Its Chip Business'. The New York Times. <https://www.nytimes.com/2023/05/11/technology/china-us-chip-controls.html>

G-7. (2023, May 20). G7 Hiroshima Leaders' Communique [Statements and releases]. <https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/20/g7-hiroshima-leaders-communique/>

Cyberspace Administration of China. (2023, May 21). Micron's products sold in China fail cybersecurity review [Press release]. http://www.cac.gov.cn/2023-05/21/c_1686348043518073.htm

Olcott, E., & Sevastopulo, D. (2023, May 22). China bans Micron's products from key infrastructure over security risk. The Financial Times. <https://www.ft.com/content/e6a8e034-cbc2-4267-9b41-b7670db7d130>

Sharwood, S. (2023, May 23). China hasn't told Micron why it failed security review, or what its ban means. The Register. https://www.theregister.com/2023/05/23/micron_china_ban_uncertainty/

Murgia, M., Bradshaw, T., & Waters, R. (2023, May 24). Chip wars with China risk 'enormous damage' to US tech, says Nvidia chief. The Financial Times. <https://www.ft.com/content/ffbb39a8-2eb5-4239-a70e-2e73b9d15f3e>

Ministry of Foreign Affairs of Japan. (2023, May 27). Ministerial statement for pillar II of the Indo-Pacific Economic Framework for Prosperity Pillar II – supply chains. <https://www.mofa.go.jp/files/100391689.pdf>

The US Department of Commerce. (2023, May 27). Substantial conclusion of negotiations on landmark IPEF supply chain agreement [Press release]. <https://www.commerce.gov/news/press-releases/2023/05/substantial-conclusion-negotiations-landmark-ipef-supply-chain>

The European Commission. (2023, May 31). Joint Statement EU-US Trade and Technology Council of 31 May 2023 in Lulea, Sweden [Statement]. https://ec.europa.eu/commission/presscorner/detail/en/statement_23_2992

The White House. (2022b, August 9). CHIPS and Science Act will lower costs, create jobs, strengthen supply chains, and counter China [Fact sheet]. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/>

The White House. (2022a, October 12). National Security Strategy. <https://www.whitehouse.gov/wp-content/uploads/2022/10/Biden-Harris-Administrations-National-Security-Strategy-10.2022.pdf>

