The New Tech Cold War? Decoding the US-China Tech Battle over AI and Semiconductors

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Source: CNBC

Introduction: The Rise of a New Tech Cold War

The global technological environment is experiencing a rapid upheaval, with artificial intelligence (AI) and semiconductors emerging as the main battlegrounds of the 21st-century geopolitical battle.[2] The rivalry between the United States and China has evolved beyond ordinary economic competition into a full-fledged Tech Cold War, where control over crucial technology determines global power. The conflict between these two superpowers is determining the direction of world

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trade, innovation, and security as artificial intelligence transforms sectors and semiconductor supply chains become essential to national security.[3]

Unlike the ideological battle of the Cold War between the US and the Soviet Union, the New Tech Cold War is defined by strategic competition over innovation, intellectual property, and control over the supply chains of vital technology.[4] AI, quantum computing, 5G networks, and, most significantly, semiconductors have become the frontlines of this struggle, with both governments implementing aggressive programs to secure their technical edge.

Emphasizing artificial intelligence and semiconductors, this paper investigates the complex dynamics of the US-China tech conflict. This commentary seeks to give a thorough knowledge of how the technical rivalry between Washington and Beijing is changing world power structures by following the historical background, evaluating the strategic relevance of semiconductors, and breaking out the AI arms race.

Historical Context: From Trade Wars to Tech Wars

The roots of the US-China technology battle can be traced back to China's *Made in China 2025* (MIC2025) strategy, launched in 2015. With an eye on global leadership in important fields such artificial intelligence, semiconductors, robotics, and advanced manufacturing, this industrial policy sought to lessen China's reliance on foreign technologies. The Chinese government actively supported research and development (R&D) initiatives, bought foreign enterprises with strategic technologies, and massively financed home tech companies.

But this ambitious plan scared US and other Western leaders. The conflict was that state-owned businesses combined with China's increasing technology impact could undermine US leadership in advanced sectors. Claims of coerced technology transfers, cyber espionage, and intellectual property theft by Chinese businesses aggravated this issue.

From Trade War to Technology War

Starting under the Trump administration in 2018, the US-China trade war first concentrated on tariffs and trade imbalances. But as the US tightened export restrictions and sanctions aimed at Chinese digital behemoths, it quickly turned into a full-scale tech conflict. Among the key flashpoints were:

National security concerns, the US blocked Huawei from gaining access to vital US technologies including semiconductors and 5G network equipment in 2019.

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[3] Brundage, Carter. "The US-China semiconductor power-security dilemma: Decoupling the security and power struggles through the theory of Dr. Barry Buzan." *International Journal* 78, no. 4 (2023): 595-613.
[4] Allen, Gregory C. "Understanding China's AI strategy: Clues to Chinese strategic thinking on artificial intelligence and national security." (2019).

The US limited China's access to modern semiconductor chips, especially those required for artificial intelligence and supercomputing, so imposing export restrictions (2020–2023).

The US government set aside $52 billion under the CHIPS and Science Act (2022) to support domestic semiconductor manufacture and lower dependency on Chinese supply chains.[5]

Semiconductors: The Critical Battleground

Modern technology rests mostly on semiconductors, sometimes known as microchips. Everything from computers and cellphones to sophisticated military systems and artificial intelligence-driven inventions runs on them. Three main reasons define the relevance of semiconductors in the US-China tech conflict:

1. **Military Purposes and National Security**

Military technology including satellite systems, AI-driven warfare, and defense capability depends on advanced semiconductors.

Particularly in AI-powered surveillance and cyberwarfare, the US worries that China's access to state-of-the-art semiconductors could improve its military capability.

2. **Technical and Financial Authority**

With a forecasted market worth more than $1 trillion by 2030, the semiconductor sector is among the most valuable industries worldwide.

Nations in charge of semiconductor manufacturing have great economic influence in world trade and technology advancement.

3. **Vulnerabilities in the Supply Chain**

With Taiwan's TSMC and South Korea's Samsung owning over 70% of the advanced chip production worldwide, the semiconductor supply chain is somewhat concentrated.[6]

Any disturbance—from trade restrictions to geopolitical concerns to hostilities (like a possible Taiwan crisis—could have disastrous consequences for world business.

4. **US Restraints on Chinese Semiconductor Availability**

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[5] Chang, Benjamin Angel. "Artificial Intelligence and the US-China Balance of Power." PhD diss., Massachusetts Institute of Technology, 2021.
[6] Sullivan, Ryan. *The US, China, and artificial intelligence competition factors*. China Aerospace Studies Institute, 2021.

The US has tightened export restrictions aiming at China's capacity to produce advanced chips in order to slow down the country's development in semiconductor technology. Among the essential steps are:

Limiting China's capacity to create innovative AI models by prohibiting the export of advanced artificial intelligence chips—such as those made by NVIDIA—to China. Sanctioning Chinese semiconductor companies such as SMIC (Semiconductor Manufacturing International Corporation), therefore restricting their access to vital US technologies.[7]

Source: The New York times

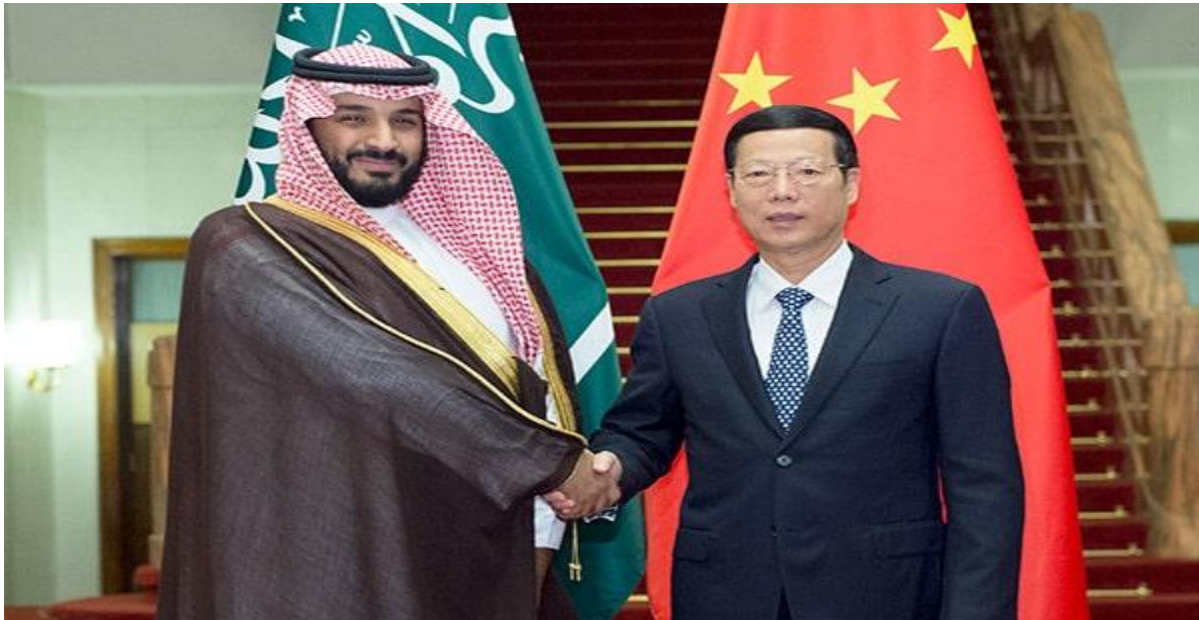### 5. The Role of Taiwan: The Geopolitical Flashpoint

Producing more than 90% of the most modern chips (5 nm and below), Taiwan's TSMC (Taiwan Semiconductor Manufacturing Company) is without a doubt the leader in advanced semiconductor manufacturing. Given both nations depend on TSMC's manufacturing capacity, this makes Taiwan a major actor in the US-China tech conflict.[8]

The dilemma facing China is: Should China launch military operations against Taiwan, the disruption of the worldwide semiconductor supply chain might cause economic anarchy. But

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[7] Peng, Yuxin. "Can US Sanctions Truly Hinder the Rise of China's Semiconductor Industry? An Analysis from the Perspective of "Creative Insecurity"." *Chinese Political Science Review* (2025): 1-35.

[8] Taylor, Brendan, and Jade Guan. "Introduction: The Taiwan Flashpoint and Asia's Middle Powers." *Asia Policy* 19, no. 2 (2024): 2-10.

forcibly acquiring TSMC would be unworkable since modern semiconductor production depends on worldwide cooperation.

The AI Race: Who Will Lead the Future of Artificial Intelligence?

Artificial intelligence (AI) is one of the most critical areas of the US-China technology battle, with both nations recognizing its potential to revolutionize industries, military capabilities, and economic power. [9]Innovations in machine learning, natural language processing, robotics, and autonomous systems together constitute a multifarious rivalry in artificial intelligence development. The nation that rules artificial intelligence will not only define global norms, data governance, and security systems but also future technical environments.

US Against China: Rivals' AI Approach

US: United States Driven by big tech companies as Google (DeepMind), Microsoft (OpenAI), Meta, and NVIDIA, the US has long had a leadership role in artificial intelligence development. The US AI policy emphasizes:

Companies such OpenAI, Google, and Microsoft lead in AI innovations from the private sector.Advances in military artificial intelligence: Pentagon expenditures on surveillance, cybersecurity, and autonomous weapons AI.

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[9] Intahchomphoo, Channarong, and Odd Erik Gundersen. "Artificial intelligence and race: A systematic review." *Legal Information Management* 20, no. 2 (2020): 74-84.

Regulatory issues: The US is beginning conversations on ethical AI development and AI government.

China: As detailed in its New Generation AI Development Plan, Beijing wants to be the world leader in artificial intelligence by 2030. China's AI plan centers on:

Government-backed artificial intelligence research: Particularly in AI surveillance and deep learning, large expenditures on state-run initiatives

Integration with national security: China's military modernizing and intelligence activities revolve on artificial intelligence.

Data advantage: Chinese artificial intelligence models can train on more large-scale datasets since access to great volumes of data resulting from less privacy regulations allows.

Designing AI chips is a US specialty; companies like NVIDIA and AMD rule the market. To hinder China's AI progress, the US has placed export limitations on high-performance AI chips including NVIDIA's A100 and H100.

While China is creating its own governance model including rigorous government supervision over AI-generated content, the US is advocating AI ethics and regulation.

Both countries are using artificial intelligence in warfare for drone warfare, cyberdefense, and autonomous combat systems among other military uses.

Taiwan's Role: A Flashpoint in the Semiconductor War

Taiwan is the most important geopolitical hotspot in the US-China tech conflict since it holds the key to world semiconductor manufacture. Leading producer of innovative chips, Taiwan Semiconductor Manufacturing Company (TSMC) provides necessary semiconductors to Apple, NVIDIA, and AMD.

Why is Taiwan so relevant?

Dominance of TSMC: far ahead of China's capabilities, TSMC generates over 90% of the most sophisticated chips (5nm and lower).

Geopolitical Risk: Taiwan's geopolitical position makes war likely to arise here. Should China try military action against Taiwan, it may cause havoc with the whole semiconductor market.

US Dependency: For military and consumer-grade semiconductors, the US mostly depends on TSMC; so, Taiwan's security is first concern for US policy.

The US Strategic Approach: Investing billions to create domestic semiconductor manufacturing facilities, including a new TSMC plant in Arizona, the US is securing supply chains under the CHIPS and Science Act (2022).

Limiting China's Access: The US has prevented China from acquiring advanced chip-making tools and talent. Washington has strengthened Taiwan relations by boosting military assistance meant to discourage Chinese aggression toward the island.

China's Plan: Reversing Taiwan Dependency

China is significantly funding companies like SMIC to lower dependency on foreign chips, hence developing domestic semiconductor capability.[10]Beijing has raised military activities surrounding Taiwan, therefore indicating its long-term aim of unification. Strategic pressure on Taiwan.

The Global Impact: Supply Chains, Trade, and Economic Shifts

The tech war is reordering world supply networks and causing economic decoupling between the US and China. Important events include:

Emerging as alternate semiconductor and electronics manufacturing hubs are India, Vietnam, and South Korea. China is creating its own substitutes for Western technologies (like HarmonyOS instead of Android), therefore fragmenting technological norms. Rising production costs for IT companies are resulting from trade barriers and supply chain changes that affect worldwide enterprises' expenses. Countries today have to choose sides, matching US-led or China-led IT ecosystems, therefore influencing world trade alliances.

Military and Cybersecurity Implications of the Tech War

The US-China tech conflict is a military and cybersecurity dominance race as much as an economic one.

Both nations are including artificial intelligence into robotics, drones, and autonomous weaponry. Development of AI-driven combat systems aims to maximize military capability while reducing human participation.

Targeting government agencies, businesses, and essential infrastructure, US and China conduct cyber espionage. Tools of statecraft now are cyberattacking, data breaches, and disinformation operations produced by artificial intelligence. A breakthrough in quantum computing might destroy encryption, therefore providing an advantage for the top nation in intelligence and cyber

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[10] Park, Jaehan. "Geopolitics in East Asia: Korea and Taiwan as Flash Points and "Chiplands"." In *The Palgrave Handbook of Contemporary Geopolitics*, pp. 1-21. Cham: Springer Nature Switzerland, 2024.

defense. Racing to reach quantum dominance, the US and China could reshape world cybersecurity.

Focusing on artificial intelligence, cybersecurity, and next-generation warfare capabilities to offset China's ascent, the US is building tech-driven military partnerships including Aukus (Australia-UK-US).

Rising militarization of technology creates security concerns and might lead to escalation of digital warfare among world superpowers.

China's Countermeasures: Navigating Sanctions and Building Self-Reliance

China is aggressively following a self-reliance in AI and semiconductor development approach to offset the US-imposed technological constraints. Beijing is bolstering international alliances, massively investing in local production capacity, and looking for means to get over Western limitations.

China's reliance on foreign semiconductors—especially Taiwan's TSMC and US-designed chips from firms like NVIDIA and Intel—exposes its greatest weakness in the tech battle. To close this distance:

To create indigenous alternatives, the Chinese government has lavished billions on chip makers such as SMIC (Semiconductor Manufacturing International Corporation).Innovations in domestic chips: Despite US sanctions, Huawei's latest creation of a 7nm Kirin processor points to China's rising capacity to produce advanced semiconductors.[11]China is striving to create its own fabrication technology as the US has banned the export of semiconductor production tools (such as ASML's EUV lithography machines).China has sought other alliances to support its tech aspirations in spite of Western constraints:

Russia: enhancing technology collaboration particularly in cybersecurity and artificial intelligence.

Middle East and Africa: Increasing infrastructure and tech project investment will help to secure rare earth minerals required for chip manufacture. Diverse supply chains by investing in semiconductor research and manufacturing in Southeast Asia help to reflect this.

Reverse-engineering current technologies is a well-known ability of Chinese companies to produce advanced goods. Using this approach, one has seen:

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[11] Zhang, Zhu. "Cutting the Tail Off to Survive: China's Tech Companies' Business Strategy under US Economic Sanctions." *China Report* (2025): 00094455251323734.

Creating substitute artificial intelligence chips for the limited CPUs made by NVIDIA.[12] Developing local operating systems substitute for Android and iOS like HarmonyOS.

Building parallel supply chains to get around Western export restrictions. China still trails behind in the most advanced semiconductor technology (e.g., 3nm chips), but its relentless drive for self-reliance should help it to close the difference in a decade.

The Future of US-China Tech Competition: What Lies Ahead?

Forecasting the next phase of the tech war encompassing artificial intelligence control, quantum computing, and the fight over 6G and beyond.

First to reach quantum dominance could be quantum computers, so upsetting intelligence systems and worldwide cybersecurity. The US and China are creating rival AI governance systems, hence perhaps separating the AI ecosystem. China already has experimental 6G satellites launched, both nations are vying to determine the future of ultra-fast wireless technology.

Conclusion

The US-China tech war is redefining world power dynamics and influencing military strategy, supply networks, digital sovereignty, three possible results await the planet:

Leading distinct AI, semiconductor, and cybersecurity ecosystems, the US and China drive total tech decoupling that forces global businesses to choose sides.

Managed Competition: Rivalry persists, but in fields including climate tech, medical artificial intelligence, and international cybersecurity agreements strategic cooperation surfaces.

Global Tech Governance: To balance national security with innovation, the globe forms multinational accords on AI and semiconductor trade.

Whether countries decide on collaboration or confrontation will determine the course of world technology. Can the world create a shared technological order or will it stay fractured? The digital world of next generations will be shaped by the choices taken today.

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[12] Bu, Qingxiu. "Can de-risking avert supply chain precarity in the face of China-US geopolitical tensions? From sanctions to semiconductor resilience and national security." *International Cybersecurity Law Review* 5, no. 3 (2024): 413-442.