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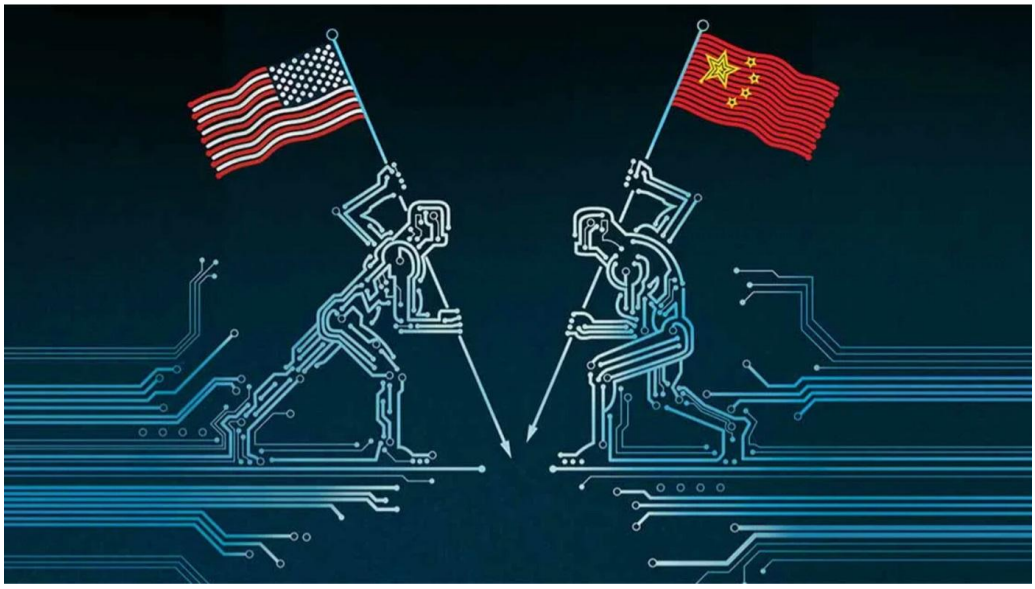
INSIGHTS

U.S vs. China: Technological Rivalry



EXECUTIVE SUMMARY

The U.S. and China, while commercially interdependent as the world's two largest economies, are locked in a high-stakes technological rivalry. The nations have spent the last two decades economically intertwined but are in the process of decoupling as their national interests are increasingly less aligned. The competition for industrial sovereignty has only heightened with the emergence of generative artificial intelligence (GenAI). GenAI has catalyzed a race for AI supremacy given the long-term economic and military implications. As globalization trends wane, corporations and investors must prepare for a bifurcated world.

THE GREAT DECOUPLING

The relationship between the United States and China has undergone a profound transformation since China's entry into the World Trade Organization (WTO) in 2001. At the time, the prevailing view in Washington and across much of the global business community was that deeper economic integration would accelerate China's modernization and align it more closely with democratic, free-market capitalism. For nearly two decades, that framework appeared mutually beneficial. U.S. companies gained access to a vast and rapidly growing consumer market, while China leveraged foreign investment and low cost labor to become the world's manufacturing hub.

As China's economic rise accelerated—from 4% of global GDP at the time of its WTO entry in 2001 to nearly 20% today—discomfort grew in the United States over widening trade imbalances, intellectual property theft, and industrial policies that favored state-backed national champions. Xi Jinping was elected president of the National People's Congress in 2013 and subsequently Chinese rhetoric towards the independent status of Taiwan became increasingly aggressive. By the mid-2010s, bipartisan consensus had shifted from viewing China as an economic partner to a strategic competitor. Advances in Chinese technology, including telecommunications equipment, renewable energy, robotics and artificial intelligence, challenged

longstanding U.S. leadership and heightened concerns around national security and supply-chain resilience. Graham Allison's bestseller, *Destined for War,* entered the zeitgeist in 2017. In his book, Allison explains the Thucydides Trap, which describes the historical tendency for conflict to emerge when a rising power threatens to displace an established ruling leader. The historical perspective provided by the Thucydides Trap frames the escalating competition as a struggle for global hegemony.

The trade war initiated in 2018 marked a defining inflection point which made the competitive dynamics between the two countries more explicit. The "engagement first" strategy that had characterized prior decades was replaced by tariffs, export controls, and investment restrictions. Simultaneously, China adopted a more assertive industrial policy through initiatives such as "Made in China 2025," expanded state subsidies, and tighter controls over data and foreign participation in its domestic markets.

The decoupling dynamic was further exacerbated by the 2020 COVID-19 pandemic. As global supply chains splintered, vulnerabilities were revealed in critical areas, particularly semiconductors. Global policymakers awakened to the fact that Taiwan, the manufacturing hub for the world's leading-edge chips, served as a precarious chokepoint along the semiconductor supply chain.

> "The single biggest threat to the world economy, the single biggest point of single failure, is that 97 percent of the high-end chips are made in Taiwan. If that island were blockaded, that capacity were destroyed, it would be an economic apocalypse." – *Scott Bessent, U.S. Treasury Secretary, January 2026*

The pandemic-induced supply chain havoc was the catalyst for more assertive U.S. industrial policy implemented in 2022, including the Inflation Reduction Act and CHIPS and Science Act, both of which aim to reshore critical manufacturing. The U.S. also implemented more stringent export controls, designed to stymie China's efforts to build its own domestic supply chain.

Today, the U.S.–China relationship is defined by strategic competition across economic, technological, and security domains. While both countries remain deeply intertwined, globalization is no longer presumed to bring convergence, and the race for industrial sovereignty and technological supremacy has become the central focus of bilateral policy.

THE ENGINEERING STATE VERSUS THE LAWYERLY SOCIETY

In his recently published book, *Breakneck: China's Quest to Engineer the Future*, author Dan Wang contrasts China's "Engineering State" with what he calls the United States' "Lawyerly Society." These terms are used to describe China's emphasis on tangible industrial output versus America's economy, which is disproportionately influenced by its elaborate legal system. Each approach has tradeoffs. China's technocracy has proven effective at focusing resources to quickly build infrastructure – e.g., high speed rail, telecommunication systems, clean energy technology – but often at the cost of individual rights, free capital markets and the environment. Conversely, the "Lawyerly Society" excels at protecting intellectual property, civil liberties and maintaining ecological stewardship, but the highly regulated nature of the U.S. makes it impossible to build at the pace of China. As one high-profile example, the construction of an 819-mile high-speed rail between Beijing and Shanghai opened just three years after construction began in 2008 at a total cost of $36 billion, while a similar 800-mile high-speed connection between San Francisco and Los Angeles, also approved in 2008, has racked up an estimated cost of $128 billion with no clear completion date as of the time of this writing.

A CR450 bullet train undergoing tests in Beijing.

Source: The State Council Information Office

The U.S. and China have also diverged in manufacturing proficiency. China's core competency in manufacturing was developed over decades of globalization as western companies, like Apple, outsourced the capital-intensive aspects of their supply chain. What began as a hub for low-cost assembly has matured into an ecosystem of advanced manufacturing for components such as display panels, high-density batteries and precision sensors. China has leveraged these capabilities to extend into next-generation technologies, such as robotics, drones and autonomous vehicles. China has accumulated what Wang refers to as "process knowledge", which is the intangible expertise that can only be acquired through the experience of manufacturing at scale. In contrast, the process knowledge of U.S. businesses has atrophied as firms offshored manufacturing in pursuit of asset-light balance sheets and high margins. Rare earth metals serve as one timely example. Rare earths are critical components for a range of technologies including automobiles and advanced weapons. The challenge with rare earths is not the scarcity of the elements, which are relatively abundant, but rather the grueling and environmentally hazardous engineering required to extract and refine these elements into usable forms. The U.S. was the global production leader in the 1970s, but gradually ceded its position to China, which benefitted from lower labor costs, lax environmental standards and state-subsidized pricing. Today, China controls 60-80% of global processing of lithium, cobalt, and rare earth elements.

> "China has spent decades building control over minerals, bankrolling projects at home and acquiring assets abroad. Its producers have consolidated into behemoths that the state can control and which have the market power to deter would-be competitors by flooding global markets—even if that means taking temporary losses." – *Digging for victory: America is racing to break China's chokehold on critical minerals, The Economist, February 28, 2026*

Losing leadership in these dirty industrial activities was of limited concern to U.S. policymakers until recently. In April 2025, China restricted the export of certain rare earths in response to the U.S.'s retaliatory tariffs. Though exports have since resumed, a key U.S. vulnerability has been revealed. Rare earths are but one of many manufacturing industries the U.S. is attempting to revive to shore up national security at a time when the competitive stakes are rising.

TECHNOLOGICAL RIVALRY

The emergence of generative artificial intelligence has heightened the technological rivalry between the United States and China as AI leadership has the potential to translate into economic and military superiority. Both nations are aggressively vying for dominance along multiple competitive fronts. The three primary battlegrounds along the technology stack include hardware, software and governance.

#1: THE HARDWARE LAYER – SEMICONDUCTORS

Semiconductors have become a central battleground given their critical role in the technology stack. Western companies continue to dominate chip design (e.g., NVIDIA, Broadcom, AMD) and semiconductor manufacturing equipment (e.g., Applied Materials, Lam Research, ASML), but most semiconductor manufacturing has been relocated overseas. Taiwan Semiconductor Manufacturing Company (TSMC) manufactures approximately 90% of the world's leading-edge chips. For a comprehensive history of the semiconductor industry, refer to our previously published white paper.

In the U.S., there is a highly nuanced policy debate over the merits of limiting China's access to advanced chips. Restricting China's access to leading edge semiconductors and semiconductor equipment would impede their progress in AI and prevent China from using U.S. developed technology in military applications. Alternatively, exporting semiconductors to China may keep the country dependent on western technology and limit their motivation to develop their own semiconductor ecosystem. There are divergent opinions among industry experts.

> Anthropic Chief Executive Officer Dario Amodei said selling advanced artificial intelligence chips to China is a blunder with "incredible national security implications" as the US moves to allow NVIDIA Corp. to sell its H200 processors to Beijing. "It would be a big mistake to ship these chips," Amodei said in an interview with Bloomberg Editor-in-Chief John Micklethwait at the World Economic Forum in Davos, Switzerland. "I think this is crazy. It's a bit like selling nuclear weapons to North Korea." – *Bloomberg, January 20, 2026*

Ben Thompson, a technology analyst, counterargues that AI has a physical dependency on Taiwan that can easily be destroyed by the Chinese if the West were to establish an insurmountable lead.

> "I want China dependent on not just U.S. chips but also on TSMC directly, which is why I argued in favor of selling NVIDIA chips to China, and further believe that Huawei and other Chinese companies ought to be able to source from TSMC." – *Ben Thompson, Stratechery, January 26, 2026*

Official U.S. policy on Chinese export restrictions continues to evolve, with the U.S. having backed down from its most restrictive posture and recently allowing the shipment of NVIDIA's H200 chip, a generation behind the company's leading Blackwell processor. Even if the U.S. were to expand access to its chips, China, aware of its vulnerabilities, is likely to pursue a domestic semiconductor industry with abandon. Indeed, China is discouraging the use of NVIDIA technology and promoting the consumption of domestic chips whenever possible. In their most recent earnings call on February 25, 2026, Chief Financial Officer Colette Kress stated that "we do not know whether any imports will be allowed into China. Our competitors in China, bolstered by recent IPOs, are making progress and have the potential to disrupt the structure of the global AI industry over the long-term."

China has been pursuing self-reliance for over a decade. In 2017, President Trump imposed a ban on Chinese telecommunications company ZTE for violating sanctions against Iran and North Korea. ZTE's operations were effectively crippled overnight by being unable to access U.S. components. The Trump administration then took aim at Huawei, campaigning that the use of its equipment in the telecommunications infrastructure of other countries posed a security risk. These and other geopolitical spats have prompted China's self-sufficiency efforts across sectors such as food, energy and technology, industries of strategic priority that were formalized in China's proposed 15th Five-Year Plan published in 2025.

#2: THE INTELLIGENCE LAYER – AI

In January 2025, China's DeepSeek stunned the world with the performance and efficiency of its AI model, all the more impressive given China's late entry into LLMs and export restrictions designed to obstruct the country's AI development. Critics may argue that DeepSeek copied the frontier models designed in the U.S. Indeed, Anthropic has disclosed evidence that leading AI developers in China, including DeepSeek, violated their terms of service by using distillation techniques, generating millions of exchanges with Claude from thousands of fraudulent accounts to free ride on Anthropic's research and development. OpenAI had previously made similar accusations. Fair or not, Chinese AI labs are innovating quickly and becoming competitive with the frontier models in the U.S. Sam Altman, the CEO of OpenAI, told CNBC in February 2026 "the progress of Chinese companies across the entire stack, and also not just in AI but in many fields, is just remarkable."

Source: The Economist

A defining characteristic of the competitive landscape between AI model builders in the U.S. and China is the contrast between "closed" and "open-weight" model architectures. U.S. champions like OpenAI, Anthropic and Google have maintained a lead with proprietary, closed systems while China has emerged as the undisputed global leader in open-weight models. These models do not reveal the data or algorithms used to train the neural network but do provide the underlying parameters which can be downloaded, customized and hosted on secure infrastructure, rather than access through the cloud, to enhance data security. On Hugging Face, an open-source library for AI and machine learning, downloads of Qwen, an open-weight model from Alibaba, have overtaken those of its Meta Platforms rival, Llama. While OpenAI, Google, Anthropic and xAI continue to lead in performance benchmarks, Chinese competitors are closing the gap and gaining broader adoption among western companies such as Airbnb. Many bigger U.S.

businesses, however, remain hesitant to adopt Chinese models due to concerns over data privacy and the potential for Chinese models to be banned.

Underpinning the rivalry between U.S. and Chinese AI labs is a fierce war for talent. Ben Horowitz, co-founder of venture firm Andreesen Horowitz, recently stated that there are only a handful of people in the world who are capable of building LLMs: "If you haven't been at Google or Facebook or OpenAI or Anthropic, and you weren't one of the main people, then you probably don't know how to do it, because you can't learn it in school, and you can't learn it in school because it's a little alchemistic in nature." Today's leading AI researchers command scarcity premiums with compensation packages in the 9-figures. The U.S. maintains a lead in elite AI researchers, but China has a strong academic foundation on which to build a future talent pool. It is expected that China will have graduated more than twice as many PhDs in Science, Technology, Engineering and Math (STEM) than the United States in 2025.

> "Nine out of the top ten science and technology schools in the world are now in China… it has completely flipped… they have a large population of highly qualified students… 50% of the world's AI researchers are Chinese… 70% of last year's AI patents were published in China… the ecosystem of AI in China is vibrant, rich and incredibly innovative." – *Jensen Huang, CEO NVIDIA, December 4, 2025*

Algorithms and talent are of little use without sufficient electricity to power LLMs. Training a frontier LLM can consume more electricity than a small city. As the scale of AI training clusters approaches millions of interconnected chips, electricity is becoming a primary bottleneck along the value chain. The U.S. and China operate under very different energy landscapes shaped by their respective regulatory and industrial policies. U.S. technology companies are constrained by an aging electric grid, extensive regulatory lead times to bring new power generation online, and commitments to carbon emission goals. In contrast, the Engineering State is a leader in ultra-high voltage transmission and favors industrial output over climate targets. China's reliance on coal has historically wreaked havoc on its environment, but the country nonetheless continues to build coal-fired power plants to provide a baseload for its AI ambitions.

#3: THE GOVERNANCE LAYER – TECHNOLOGY STANDARDS

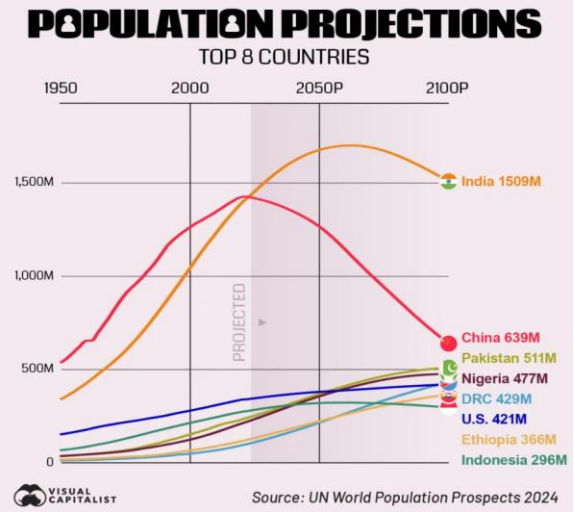
The competition between the two countries is not merely technical, but ideological. As the AI revolution progresses, American technologists and policymakers want to ensure that global AI standards are aligned with western principles, and not the "socialist core values" that China requires in its AI generated content. Today's bifurcated internet serves as precedent. The existing U.S. tech stack, however imperfect, is grounded in a commitment to individual rights, freedom of speech and transparency. In contrast, China implements tight censorship and has deployed broad surveillance systems across its population. This has fueled fears that any technology exported from China could be contaminated with security risks, which was the basis for the forced sale of TikTok's American business. In the case of AI, policymakers worry that Chinese models will reflect authoritarian values. Indeed, the Chinese policymakers are enforcing regulatory guardrails around AI development while trying not to harm the incentive for innovation.

> "The internet was once seen as an existential threat to the ruling Communist Party, but Beijing instead brought it to heel through a system of censorship and tight control over China's largest internet companies. Artificial intelligence poses a similar dilemma: a transformative force that promises economic gains while having the potential to undermine the party's grip on power." – *Meaghan Tobin and Xinyun Wun, "Move Fast, but Obey the Rules: China's Vision for Dominating A.I." The New York Times, February 2, 2026*

China has a history of exporting infrastructure and technology abroad to garner global influence. The Belt and Road Initiative (BRI), launched in 2013, aims to bolster global trade routes by building infrastructure such as railways, ports, and fiber optic cables with regional partners across Asia, the Middle East, Africa and Latin America. Pundits argue that China's ulterior motive is to expand its military reach and make participating nations interdependent on China's economy. Many countries have found themselves unsustainably indebted to China because of the BRI. China's influence also extends into the digital realm through Chinese companies Huawei and ZTE, who have provided surveillance systems to countries like Venezuela and Iran.

It is through these digital channels that some fear China could export their AI standards. The State Council of China released its "AI Plus" strategy in 2025 which was established to guide China's AI development with clear milestones for AI adoption and standards. The plan includes fully realizing "Socialist modernization", meant to describe an "intelligence civilization" with engrained socialist values, by 2035. If the "AI Plus" framework proliferates and becomes the default architecture for emerging nations with close economic ties to China, it will challenge the diffusion of western technological principles.

THE LIMITS OF CENTRAL PLANNING



Source: The Visual Capitalist, The UN

Despite its many industrial and technological feats, the Engineering State's focus on tangible output has created its own set of structural fragilities. Some infrastructure, due to the sheer velocity of its construction, has a reputation for being of inferior quality. The rapid pace of expansion in China's property sector, once the nation's primary economic engine, has driven debt to nearly 300% of GDP. Strict capital controls are in place to prevent the flight of money and to maintain currency stability. China's aggressive industrial output efforts have led to overproduction and, combined with weak consumer demand, persistent deflation. Compounding these financial strains is a demographic crisis. The legacy of the One-Child Policy, which ended in 2016, has left China "growing old before it gets rich." Even today, the fertility rate, roughly 1.1, remains far below the replacement level of 2.1. The workforce population peaked in 2016, and China's total population of 1.4 billion is forecast to be nearly cut in half by the end of the century. The nation's heavy hand over the private sector, particularly measures taken against digital technology businesses in pursuit of "Common Prosperity" circa 2020, continues to weigh on the nation's entrepreneurial spirit. Youth unemployment stands at a staggering 17%. Many of China's industrial accomplishments have come at the expense of civil liberties, of which there are many well documented examples of repression, including the harsh "Zero-COVID" policies. These various headwinds have weighed on consumer confidence, which has remained at depressed levels since the pandemic. Many of China's challenges are the result of tradeoffs the country has made over the last two decades in pursuit of strong GDP growth. Still, China views technology as a potential remedy for its demographic challenges and slowing economic growth. "Sci-tech self-reliance is the key to building China into a great modern socialist country" stated Xi Jinping during a February 2026 visit to an innovation park.

CONCLUSION

China serves as a formidable competitor in the arms race for technological supremacy, but the U.S. maintains structural advantages that position it well during times of rapid technological change. While China excels at top-down industrial mobilization, the U.S. relies on a self-reinforcing ecosystem of human capital, rule of law and deep capital markets. While the Lawyerly Society may be slow to coordinate resources to build high-speed rail, the U.S. promotes entrepreneurial risk taking with strictly enforced protection of intellectual property and capital markets that direct investment toward its most productive uses.

The Great Decoupling will have major implications for investors. Supply chains are being reoriented to consider not just efficiency, but national security. The arms race for artificial general intelligence (AGI) promises to deliver economic and military advantages for those on the frontier. Finally, artificial intelligence is evolving across bifurcated ideological silos, creating the potential for a future digital economy dictated by the political values of underlying models. The technological competition between the U.S. and China is ultimately a contest of economic and ideological systems with far reaching ramifications for investors.