By Thomas Wash

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Export Controls: Another Battle in the US-China Trade War

Even though tariffs dominate the headlines today, export controls have emerged as an additional key weapon in the economic warfare between the United States and China. While the world's two largest economies continue imposing tariffs on each other's goods, they are also now strategically blocking exports of crucial technologies and minerals to each other. This transformation of supply chains into battlegrounds largely reflects how the two sides are vying for dominance in artificial intelligence. By restricting access to vital components like semiconductor equipment and rare earth elements, both nations seek to slow their rival's technological advancement while strengthening their own competitive edge.

In this report, we show how the US-China economic war has spread beyond tariffs to encompass export controls. These trade restrictions are another step in our recently published “escalation ladder” showing how the US-China conflict could worsen (see Figure 1, next page). We focus here on the controls over semiconductor technology and critical minerals and show that each side is trying to mitigate the other’s supply cut-offs. We wrap up, as always, with a discussion of the implications for investors.

Definition and History of Export Controls
While tariffs are taxes on imports aimed at limiting them and protecting domestic industry, export controls serve a more aggressive purpose — deliberately stifling another nation's industrial advancement. These measures target critical supply chain vulnerabilities, creating artificial choke points to disrupt production.

Restricting the sale of key technologies to hinder the advancement of a US adversary is not a new strategy. During the Cold War, the US blocked technology exports to the Soviet Union and Iran to curb their military development. What sets today’s export controls apart is that they reflect a major shift in how the US perceives China — from strategic competitor to outright rival.

By 2002, US officials had grown increasingly alarmed as China rapidly narrowed the technological gap in semiconductor manufacturing. Although official US policy sought to maintain at least a two-generation lead in chipmaking, intelligence assessments suggested the actual disparity had shrunk to just 3–5 years. This accelerated progress triggered a fundamental shift in Washington’s approach. Rather than simply trying to stay ahead of Chinese innovation, the US began actively working to stifle it.

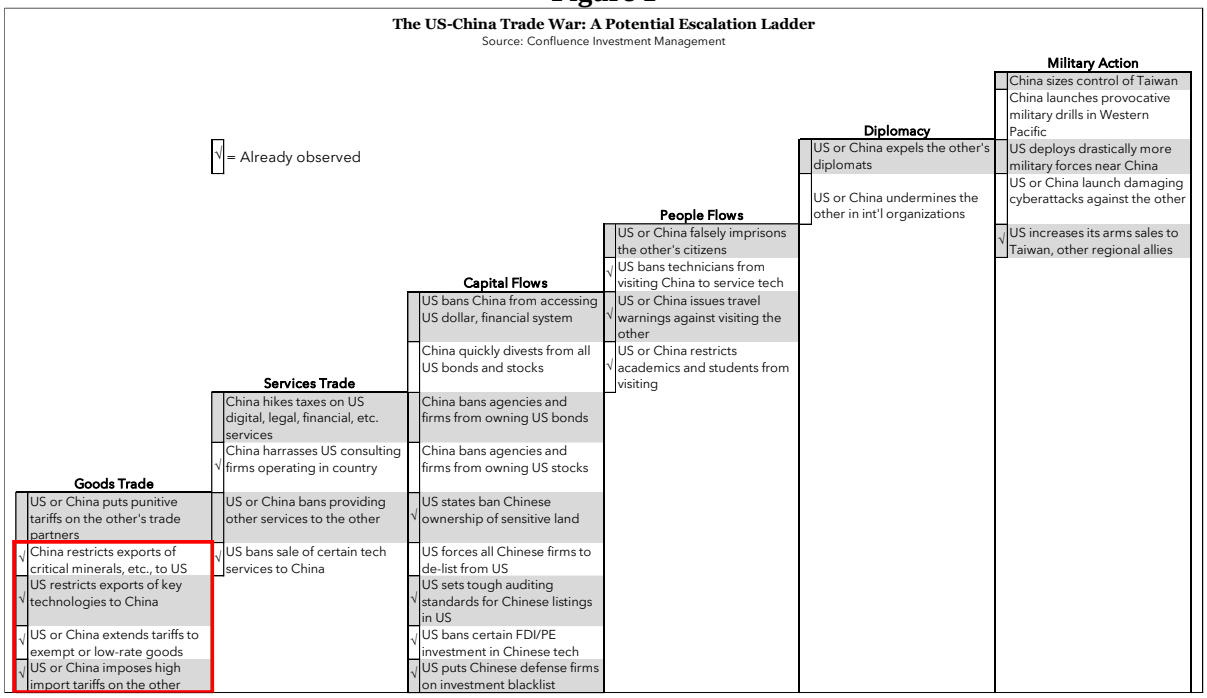
President Trump initiated a major offensive against China’s semiconductor industry in his first term. Though not publicly acknowledged until his final days in office, his administration pressed the Dutch government to block ASML — the leading lithography machine manufacturer — from exporting advanced chipmaking equipment to China. The Biden administration later

escalated these measures, imposing even stricter export controls.

The US escalated its campaign to limit China's access to critical semiconductor technology, with its strategy reaching a pivotal moment in 2022. This approach centered on three key objectives: blocking China's acquisition of advanced microchips, closing loopholes that could circumvent export restrictions, and mitigating the financial repercussions for affected US companies.

The restrictions extended beyond US firms to encompass key allies — South Korea, Taiwan, and the Netherlands — collectively known as the "Fab 4" of semiconductor manufacturing. To enforce compliance among foreign partners, the administration invoked the Foreign Direct Product Rule, granting the US government authority to regulate any overseas-manufactured goods incorporating American technology, no matter how minimal the US content.

Figure 1



US Controls on Chip Technology

Today, in President Trump's second term, both China and the US are wielding export restrictions to prevent the other from achieving a fully integrated, self-reliant semiconductor supply chain that could be weaponized to cripple the other's technological progress. The endgame is to dominate in semiconductors and AI, ensuring both economic resilience and military superiority over rivals. However, as we will describe below, the chip technology controls are mostly coming from the US to keep China from catching up to Western standards.

China's Dash for Chip Dominance. In 2019, to help achieve semiconductor self-sufficiency under the "Made in China 2025" initiative, China invested $21 billion into its domestic chip manufacturing industry, targeting manufacturing, research, and development. This substantial investment dwarfed the US's $1.7 billion funding for comparable efforts that year, underscoring China's aggressive push to dominate the

global semiconductor market. Yet, despite this massive spending, systemic corruption and a shortage of technical know-how have hindered China's progress. As a result, the Chinese have turned to partnerships with Western firms to fast-track their capabilities. While these collaborations have yielded incremental gains, they have not been decisive enough to take over the lead from their US rivals.

China's Response to US Controls. While China still trails the US by about two years in chip design and faces an even greater gap in memory chip technology, it has demonstrated consistent technological progress. Through intensified R&D investment, industrial espionage, and innovative applications of mature chip technologies, Beijing has steadily built its portfolio of intellectual property related to semiconductors. Moreover, China maintains the strategic option of forcibly integrating Taiwan, a move that would grant immediate access to its cutting-edge chip manufacturing capabilities.

To counter US restrictions on technology exports, China has ramped up investment in semiconductor research. Although it still lags the US in advanced chip manufacturing, China has surpassed it in research output, publishing twice as many papers on chip design and fabrication between 2018 and 2023. Moreover, Chinese researchers accounted for 55% of global semiconductor patents during this period.

Mounting evidence suggests China has also been actively employing commercial espionage as a key strategy to narrow its technological divide with the US and the rest of the West. Sophisticated operations targeting leading European technology firms like ASML and Belgian nanoelectronics center IMEC have involved both cyber intrusions and direct espionage attempts. Alarmingly, some high-profile incidents allegedly involve Chinese operatives compromising hardware, such as motherboards utilized by major tech companies including Apple and Amazon, through the insertion of malicious chips engineered to exfiltrate trade secrets.

Finally, China has circumvented US trade restrictions by developing AI systems optimized for less advanced domestic chips. A prime example is the January 2025 launch of DeepSeek, a surprisingly capable language model that delivers performance comparable to Google's Gemini and OpenAI's ChatGPT, despite running on more modest hardware at a fraction of the cost.

Chinese Controls Over Critical Minerals

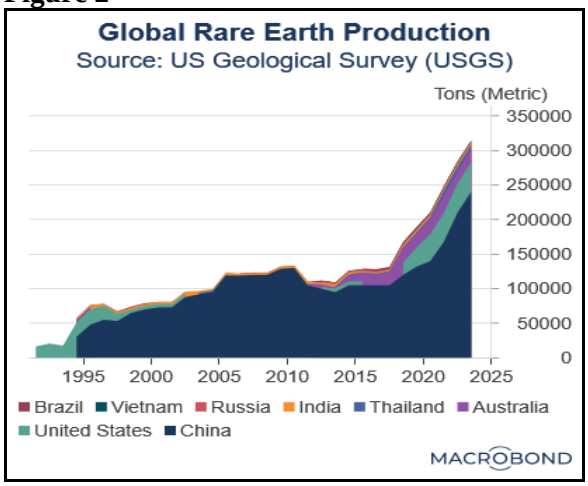
While Washington has taken deliberate steps to preserve Western dominance in semiconductors and chipmaking equipment — actively impeding Beijing's efforts to develop indigenous designs — China has countered by restricting access to critical rare earth elements (REE). These minerals serve as fundamental building blocks for advanced technologies, renewable energy systems, and modern defense applications, granting Beijing significant strategic leverage in the ongoing technological rivalry.

What Are Rare Earths? Despite their name, REEs — a group of 17 metallic elements — are relatively plentiful in Earth's upper crust, occurring more commonly than gold. While not inherently scarce, six specific REEs play particularly vital roles in semiconductor manufacturing: the light REEs (lanthanum, cerium, praseodymium, and neodymium) and the heavy REEs (terbium and dysprosium). These elements possess distinctive chemical and physical properties

that make them virtually irreplaceable in advanced chip production.

China's Dominance in Rare Earths. China maintains a commanding position in the global REE market, accounting for approximately 75% of worldwide production and nearly 98% of processing capacity for these critical materials (see Figure 2). This near-monopoly derives from two primary advantages: extensive domestic mineral deposits and a combination of permissive regulatory policies with substantial government support that has maintained relatively low production costs.

Figure 2



China's Clampdown. Given China's market dominance, any restrictions on REE exports would likely trigger significant price volatility in global markets. This dynamic became evident in 2023, when Beijing first introduced licensing and reporting requirements for gallium, germanium, and antimony exports. The most recent controls have now tightened the special license requirements for these critical materials and suspended some shipments while the government establishes the necessary framework to process applications. The Chinese government has permitted firms to honor pre-existing contracts, allowing foreign buyers to stockpile inventories before the full restrictions take effect. While this transitional measure has mitigated immediate supply disruptions, the long-term uncertainty surrounding new shipments threatens to undermine manufacturers' ability to plan future production cycles (see Figure 3).

Figure 3

The US Response to China's Controls. To safeguard its technological development from supply chain disruptions, the US has implemented a multi-pronged strategy: (1) streamlining mining regulations to accelerate domestic REE production, (2) enhancing financial incentives to stimulate private sector investment, and (3) forging international partnerships to diversify its supply chain. This comprehensive approach aims to reduce dependence on any single source while rebuilding America's critical minerals infrastructure.

- Recently, President Trump invoked emergency authorities under the Defense Production Act to strengthen US critical mineral security. The executive action accelerated permitting for domestic mining and processing operations while requiring the Interior Department to prioritize mineral extraction projects on federal lands. The administration further expanded these efforts by exploring the

potential of deep-sea mining as an alternative source for strategic materials.

- The administration has also pursued financial support for mining initiatives by establishing a Critical Minerals Fund through collaboration between the US International Development Finance Corporation (DFC) and the Department of Defense. This fund provides capital to expand domestic production capacity, with companies like MP Materials and TMC (The Metals Company) being among the key beneficiaries.
- Capitalizing on the leverage that comes from providing security aid, the administration has crafted security partnerships that tie defense cooperation to resource development. The proposed Ukraine reconstruction fund, for example, represents a dual-purpose initiative that would simultaneously rebuild that nation's economy and develop alternative REE supplies that can be used to repay the US for the military aid it has given Ukraine to help it fight off Russia's invasion. Similarly, the Democratic Republic of Congo has explored mineral production agreements with the US in exchange for security cooperation against militant groups.

Who Has the Upper Hand?

While both superpowers wield considerable strengths, China's near-monopoly over the production and processing of REEs grants it outsized influence, enabling Beijing to pressure the US by manipulating the supply and pricing of minerals vital to semiconductors, defense systems, and other critical technologies. However, as mentioned above, REE resources are "rare" in name only. With strategic investments, partnerships, and domestic mining potential, the US could mitigate China's leverage by diversifying supply chains and reducing long-term dependency.

The US, on the other hand, holds a significant advantage in chip design and manufacturing processes — one that will be very difficult to replicate. Its dominance in semiconductor technology, along with its control over key equipment production, reinforces its strong position in enforcing export restrictions. As a result, the US is still far more likely than China to lead the AI race for the foreseeable future.

A major turning point in the tech rivalry could hinge on control over Taiwan. The island is a critical manufacturing hub for leading US chip firms, giving them access to essential chip designs and production capabilities. Consequently, if China were to take over Taiwan, it could significantly accelerate Beijing's technological ambitions and narrow the gap with the US.

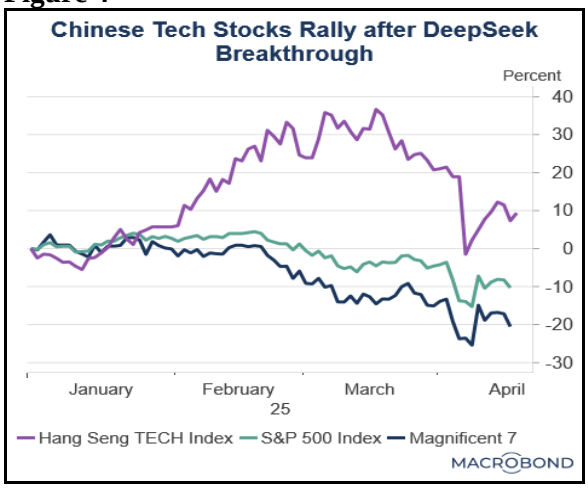
Conclusion and Investment Implications

Traditionally, trade wars are fought with tariffs. By taxing imports from other countries, governments aim to make foreign goods less competitive than domestically produced alternatives. The logic is straightforward: The resulting price advantage helps shield local industries from foreign competition, boosting domestic sales while reducing reliance on external suppliers. However, as shown in this report, tariffs are not the only tool available for economic warfare. Countries may also restrict critical materials and technologies in order to gain an edge. By keeping key resources at home, they effectively subsidize domestic industries that depend on those inputs. Meanwhile, foreign competitors are forced to scramble for costlier alternatives, disrupting their production while strengthening the restricting country's economic position.

The US and China are now deploying both tariffs and export restrictions in their battle for trade dominance and AI supremacy. This escalating rivalry threatens to fracture the global semiconductor industry, forcing chipmakers to pick sides while accelerating environmentally destructive mining in resource-rich regions.

While the competition may disrupt the chip sector in the short term, it could ultimately benefit both Chinese and American tech firms, particularly those poised to capitalize on subsidized domestic supply chains and reduced foreign competition. This strategic advantage has already buoyed the stock prices of Chinese tech companies (see Figure 4). Meanwhile, new US policy measures aimed at lowering resource costs could further enhance the long-term returns of US tech firms**.**

Figure 4



However, the short-term outlook for equities in both markets remains highly uncertain. Export restrictions and tariffs will likely dampen revenue projections, leaving many firms constrained not only in resources but also in access to markets beyond their respective blocs. That said, we expect both nations to prioritize AI development, positioning the technology as a cornerstone of their future economies.

We anticipate that both the US and China will aggressively strengthen their AI industries by realigning their economies toward technology-driven growth. Backed by subsidies and government support, leading tech firms in both countries are poised to thrive, solidifying their roles as "national champions" in the global AI competition. As AI cements its status as a cornerstone of economic power, these companies will accumulate long-term strategic influence, further entrenching their market dominance. However, the soaring valuations of AI firms in both nations may prompt investors to shift capital across borders, chasing perceived advantages as the balance of technological leadership fluctuates.

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Confluence Investment Management LLC

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