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**Rethinking Supply Chains: Mitigating the Risk of Chinese Dependence and Protecting US
Semiconductor Intellectual Property**

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By

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Abstract

This paper explores the complex economic interdependence between the US, China, and Taiwan, specifically in the semiconductor industry. China's increased aggression and intellectual property (IP) theft threatens to unbalance the iron triangle of US, China, and Taiwan trade relations. The problem overview elaborates on Taiwan's crucial role in the semiconductor supply chain, and China's threat against it. The argument is made that the US must take a nuanced and multifaceted approach to solving the diplomatic, economic, and military policy problem. Criteria for success are outlined, emphasizing the need to address root causes and not compromise US commitment to a free and fair Indo-Pacific region. Reviewing legislative history, including the 2022 "CHIPS and Science Act" this paper identifies the major stakeholders and conducts an alternative policy analysis. Proposed policy measures include economic decoupling, supply chain risk mitigation, enhanced IP protection and a strong and credible military posture. This paper recommends a comprehensive and unified trade strategy, in conjunction with a reinvigorated defense industrial base to support US forces in the Pacific theater. A unified national security grand strategy will protect critical supply chains, deter IP theft, soften Chinese aggression, and safeguard the global economy.

Introduction

Today, the US, Taiwan, and China have one of the largest economic interdependences in the world. This is by design. Prior to the 1970's there was almost no trade between China and the US. Secretary of State Henry Kissinger sought to open up relations with China, seeking to create a wedge between China and the Soviet Union.¹ This continued, with President Jimmy Carter granting full diplomatic recognition and with that opened China and US to an explosive growth in trade.² Chinese leader Deng Xiaoping “loosened” state control over industries. This was to give western nations confidence that they could do business with Chinese firms. However, the Chinese Communist Party (CCP) saw this as the golden opportunity to massively enrich their country and allow the CCP to cement their power. China’s “One China” policy has always loomed large as a threat to Taiwan, and with the newfound access to lucrative trade, China became a bigger danger to Taiwan.³ Taiwan also saw this as an opportunity to make itself indispensable to the West. While China was able to manufacture most goods cheaply and become an industry juggernaut, Taiwan focused on the singularly most important industry: semiconductors.⁴

The US had dominated the semiconductor industry for decades, as it had the cutting-edge innovation and tools to design semiconductors but building them in the US was expensive. Taiwan offered to act as a contract manufacturer, offering a skilled labor force and subsidies for building enormously expensive fabrication plants. Taiwan quickly became the world’s largest producer of semiconductors, including for advanced chips needed for US military technology.⁵ Just as China became a manufacturing base for the US, so did Taiwan for semiconductors. This has created an iron triangle of interdependence between the three countries, with Taiwan’s “silicon shield” acting as a wildcard.⁶ This iron triangle has traditionally acted as a security buffer to prevent China from invading Taiwan, but this deterrence is fading, as China becomes increasingly aggressive and willing to risk economic blowback to get what it wants.⁷ The US is at a major inflection point, from both a commercial and military perspective.⁸ This paper will

¹ “Timeline: U.S.-China Relations,” Council on Foreign Relations, accessed May 5, 2023, <https://www.cfr.org/timeline/us-china-relations>.

² “The Contentious U.S.-China Trade Relationship,” Council on Foreign Relations, accessed December 9, 2023, <https://www.cfr.org/backgrounder/contentious-us-china-trade-relationship>.

³ “Silicon Triangle: The United States, Taiwan, China, and Global Semiconductor Security,” Hoover Institution, accessed August 27, 2023, <https://www.hoover.org/research/silicon-triangle-united-states-taiwan-china-and-global-semiconductor-security>.

⁴ Richard Cronin, “Semiconductors and Taiwan’s ‘Silicon Shield’ • Stimson Center,” *Stimson Center* (blog), August 16, 2022, <https://www.stimson.org/2022/semiconductors-and-taiwans-silicon-shield/>.

⁵ Cronin.

⁶ Cronin.

⁷ “Silicon Triangle.”

⁸ David A. Ochmanek et al., “Inflection Point: How to Reverse the Erosion of U.S. and Allied Military Power and Influence” (RAND Corporation, July 25, 2023), https://www.rand.org/pubs/research_reports/RRA2555-1.html.

look at the policy problem, the legislative history, and will analyze several policy alternatives and recommendations.

Problem Overview

For very different reasons, China, and the US both severely depend on Taiwan's semiconductor manufacturing near-monopoly. The US designs most of its advanced chips at home but contracts the fabrication to Taiwan Semiconductor Manufacturing Company (TSMC).⁹ China also uses TSMC as the primary contract manufacturer for its chips, but China does not have an advanced indigenous design capability.¹⁰ It has instead relied on technology transfer, either through business deals or IP theft. China is the largest IP thief in the world, stealing \$100s of billions in IP every year.¹¹ Xi Jinping seeks China's "Great Rejuvenation" and he sees semiconductors at the heart of this plan.

China has used the technology transfer to rapidly close the technology gap between the US military and China's. Advanced US designs that have been sold or stolen are now powering Chinese technology and AI development.¹² China has been emboldened by this, and they desire control over Taiwan's fabrication technology to give them global dominance.¹³ Failing this, China's backup plan is to use the stolen technology in a more limited capacity in their domestic fabricators. Either way, China's theft and increasing aggression are a major threat to the US, Taiwan, and the global economy.¹⁴ The US finds itself in a precarious position, as the loss of TSMC fabricators would make the supply disruption from the COVID-19 pandemic seem like a minor hiccup in comparison. The US must find a strategy to restore deterrence and stabilize and protect its own supply chain from Chinese aggression. The US must take a multifaceted policy approach that includes military, economic and diplomatic concerns and use all three levers of power to establish a unified grand strategy.

Criteria for Success

When evaluating policy proposals, the criteria for success must be evaluated to ensure that a policy will address the root causes. The root cause of this policy issue is US reliance on TSMC chip manufacturing due to decades of offshoring US semiconductor fabrication, specifically, allowing a single country 100 miles offshore of China to be the global kingpin for fabrication.¹⁵ A policy must carefully reduce US supply chain risk while still providing Taiwan

⁹ "Silicon Triangle."

¹⁰ Cronin, "Semiconductors and Taiwan's 'Silicon Shield' • Stimson Center."

¹¹ Zeba Siddiqui, "Five Eyes Intelligence Chiefs Warn on China's 'theft' of Intellectual Property," *Reuters*, October 18, 2023, sec. World, <https://www.reuters.com/world/five-eyes-intelligence-chiefs-warn-chinas-theft-intellectual-property-2023-10-18/>.

¹² Siddiqui.

¹³ Ochmanek et al., "Inflection Point."

¹⁴ "Silicon Triangle."

¹⁵ "Silicon Triangle."

with a conventional military shield of deterrence to replace their “silicon shield.”¹⁶ The US cannot abandon Taiwan to allow it to be absorbed into China. Taiwan is a key democratic ally, and the biblical principles of government require threats to life, liberty, and property be considered.¹⁷ The threat to Taiwan is direct, but there is an indirect threat to Americans through the destruction of the global economy. US policy must take this very seriously, as a failure to maintain deterrence would cause a potential global depression.¹⁸

From a federalism perspective, US policy must be balanced. Private US companies should have relative freedom to sell their goods and make contracts with who they choose, but the federal government is responsible for security and foreign policy. If trade and economic partnerships become a major factor in foreign policy, then the US has the right to institute restrictions and protections to economic trade. US companies also have an ethical consideration to not purposefully enrich and empower the CCP, which is one of the most oppressive and unjust regimes in the world.¹⁹ A successful US policy will tailor economic policy to embrace US manufacturing capability and disincentivize outsourcing to China or Taiwan. A policy that embraces these criteria for success will protect US critical supply chains, defend US IP from Chinese theft, incentivize US fabrication, protect Taiwan from invasion, and contain China and the CCP from exporting its despotism and controlling the Indo-Pacific region.

Legislative History Stakeholders

To understand the policy process on the US/Taiwan/China situation, the major stakeholders must be addressed.²⁰ In the US, the President is the most important stakeholder. He controls foreign policy and therefore sets the agenda. Congress is the next major stakeholder. The Senate advises on foreign policy, must ratify treaties, and pass bills. The House controls policy funding and spending bills. Advisory bodies such as the National Security Council and the National Economic Council are important stake holders because their input often informs Executive Branch decisions. US tech companies are also major stakeholders. They stand to profit or lose the most based on US policy.²¹ Taiwan and major US allies are stakeholders too, as US

¹⁶ Mark F. Cancian, Matthew Cancian, and Eric Heginbotham, “The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan,” January 9, 2023, <https://www.csis.org/analysis/first-battle-next-war-wargaming-chinese-invasion-taiwan>.

¹⁷ “BIBLICAL PRINCIPLES of HISTORY and GOVERNMENT.Pdf: PPOG500: Introduction to Research and Writing (001),” accessed December 7, 2023, https://canvas.liberty.edu/courses/497827/files/95195781?module_item_id=54135842.

¹⁸ “The Global Economic Disruptions from a Taiwan Conflict,” *Rhodium Group* (blog), accessed December 9, 2023, <https://rhg.com/research/taiwan-economic-disruptions/>.

¹⁹ “China’s System of Oppression in Xinjiang: How It Developed and How to Curb It,” Brookings, accessed December 9, 2023, <https://www.brookings.edu/articles/chinas-system-of-oppression-in-xinjiang-how-it-developed-and-how-to-curb-it/>.

²⁰ Jessica R. Adolino and Charles H. Blake, *Comparing Public Policies: Issues and Choices in Industrialized Countries* (SAGE, 2010).

²¹ “Losing Taiwan’s Semiconductors Would Devastate the US Economy | Hudson,” August 7, 2023, <https://www.hudson.org/technology/losing-taiwan-semiconductor-would-devastate-us-economy-riley-walters>.

decisions will affect their own security and economic outlook. Lastly, China is a stakeholder too. In any conflict, even a cold one, the adversary gets a vote. China can affect trade with the US and its allies, and its reaction to US policy can have effects on regional stability.²²

Current Legislation and Regulations

For the last several decades, US policy was fairly relaxed on US exports of semiconductors and of outsourcing the manufacturing to places like Taiwan and China. TSMC, the major firm in Taiwan that builds the largest portion of the world's semiconductors, does not design its own chips.²³ It acts as a major contract foundry for tech companies that do not do their own fabrication or who need additional industrial capacity.²⁴ This includes major American tech companies such as Qualcomm, Nvidia, and Apple. This globalized semiconductor supply chain is lucrative and cost-efficient. However, it has been shown to have severe vulnerabilities. The COVID-19 pandemic led to the temporary shuttering of major fabricators, and orders being cancelled. This led to a screeching halt of the global semiconductor supply chain, with delays and disruptions in nearly every industry reliant on semiconductors, from automobiles to appliances.²⁵ The DOD took note, realizing that supply chain was even more vulnerable than it was assessed.²⁶ The DOD briefed key Senators and House members on the dire conditions of the supply chain, and Congress responded with a flurry of bills such as H.R. 5479 "Supply Chain Act" and S. 1260 "United States Innovation and Competition Act of 2021."²⁷ However, these bills, for one reason or another, did not move outside of Congress. It was not until 2022 that major legislation would make it to the President.

In 2022, President Biden signed the "Bipartisan CHIPS and Science Act" which was comprehensive in nature.²⁸ The "CHIPS Act" allocates over \$280 billion over 10 years for scientific R&D, with \$53 billion to promote US semiconductor manufacturing, \$24 billion worth of tax credits for companies that invest in US chip production, and \$3 billion for programs that

²² "The Contentious U.S.-China Trade Relationship."

²³ Cronin, "Semiconductors and Taiwan's 'Silicon Shield' • Stimson Center."

²⁴ "Losing Taiwan's Semiconductors Would Devastate the US Economy | Hudson."

²⁵ Wassen Mohammad, Adel Elomri, and Laoucine Kerbache, "The Global Semiconductor Chip Shortage: Causes, Implications, and Potential Remedies," *IFAC-PapersOnLine*, 10th IFAC Conference on Manufacturing Modelling, Management and Control MIM 2022, 55, no. 10 (January 1, 2022): 476–83, <https://doi.org/10.1016/j.ifacol.2022.09.439>.

²⁶ "DOD Addresses Supply Chain Resiliency With Lone Star State Industry," U.S. Department of Defense, accessed December 9, 2023, <https://www.defense.gov/News/News-Stories/Article/Article/3070036/dod-addresses-supply-chain-resiliency-with-lone-star-state-industry/https%3A%2F%2Fwww.defense.gov%2FNews%2FNews-Stories%2FArticle%2F3070036%2Fdod-addresses-supply-chain-resiliency-with-lone-star-state-industry%2F>.

²⁷ Charles E. [D-NY Sen. Schumer, "S.1260 - 117th Congress (2021-2022): United States Innovation and Competition Act of 2021," legislation, June 8, 2021, 2021-04-20, <https://www.congress.gov/bill/117th-congress/senate-bill/1260>.

²⁸ Tim [D-OH-13 Rep. Ryan, "Text - H.R.4346 - 117th Congress (2021-2022): Chips and Science Act," legislation, August 9, 2022, 08/09/2022, <http://www.congress.gov/>.

help secure supply chains for leading edge programs and advanced technology.²⁹ The importance of the law is twofold. It incentivizes US companies and friendly foreign companies to invest in the US and build or expand fabricators in the US. This leads to more US jobs, and it somewhat insulates the US and global supply chains from the disruption of a Chinese invasion of Taiwan. The tax breaks and fabrication subsidies come with strict export control rules, where any corporation that takes the funds cannot sell their most advanced designs and chips to China, and that they must not invest in Chinese fabrication foundries. The other \$200 billion in the bill is to promote US innovation and development, to help ensure that the US maintains and expands its technological superiority over China and to stimulate advanced dual use technology that will allow the US military to maintain an edge over China.³⁰

In addition to the export controls in the “CHIPS Act,” President Biden has also signed an Executive Order to further tighten the rules and regulations concerning these export controls, including closing loopholes that will stem the flow of chips used for AI and specialized chip design tools from entering China.³¹ This expands on actions taken under the Trump Administration, which saw the banning of US suppliers from doing business with Fujian Jinhua Integrated Circuit for stealing IP in 2018 and the banning of Huawei in 2020 due to IP theft and installing spyware into US telecom infrastructure.³² These export controls have infuriated China, which sees these actions as direct efforts to contain China and blunt their rapid military modernization. China has placed its own restrictions on the export of critical rare earth elements, many of which are used to build advanced technology.³³

Alternative Policy Analysis and Recommendations

Economic Decoupling and IP Protection

The “CHIPS Act” has been a very strong move in the right direction to economically decouple from China and Taiwan on the most critical semiconductor manufacturing. However, more must be done, both to reduce China’s theft of US and allied IP, and increase the security posture in the Indo-Pacific to reassure Taiwan and other regional allies such as Japan and South Korea.³⁴ On China’s IP theft there are several potential policy options. Bills like H.R. 1016, the “Stop China’s IP Theft Act,” would sanction CCP members and prevent most CCP officials from

²⁹ “The CHIPS and Science Act: What Is It and What Is in It? | McKinsey,” accessed December 9, 2023, <https://www.mckinsey.com/industries/public-sector/our-insights/the-chips-and-science-act-heres-whats-in-it>.

³⁰ “The CHIPS and Science Act: What Is It and What Is in It? | McKinsey.”

³¹ “‘Guardrails’ on CHIPS Act Funding to Restrict Investments in China May Restrict Participation in CHIPS Act Incentives | Perspectives on Innovation | CSIS,” accessed November 30, 2023, <https://www.csis.org/blogs/perspectives-innovation/guardrails-chips-act-funding-restrict-investments-china-may-restrict>.

³² “US Targets China over Semiconductors,” *Reuters*, June 30, 2023, sec. Technology, <https://www.reuters.com/technology/us-targets-china-over-semiconductors-2023-06-30/>.

³³ “‘Guardrails’ on CHIPS Act Funding to Restrict Investments in China May Restrict Participation in CHIPS Act Incentives | Perspectives on Innovation | CSIS.”

³⁴ Ochmanek et al., “Inflection Point.”

doing business with the US or entering the US until China stops stealing US IP.³⁵ Bills like this are mostly symbolic and have a small chance of becoming law. However, the larger point remains that there needs to be additional pressure placed on China and the CCP to dissuade continued theft. The biggest policy alternative that provides the US with leverage is the concept of reciprocity. China unfairly targets US corporations and pressures companies to share trade secrets or submit blueprints for scrutiny.³⁶ The US does not do that to Chinese firms. There are two playing fields, and one is rules based, the other is heavily tilted in the CCP's favor. China knows this and actively exploits the US laws to its own advantage. The US can further place trade limitations on Chinese firms when China targets US firms, and it can place even more restrictive export controls on technology, not just sensitive dual use technology.³⁷

There are limitations to this approach. The US is subject to the World Trade Organization (WTO) rules and regulations. There are acceptable national security exemptions that allows the US to have export controls. However, if the US applies this too broadly and it can be seen as economic protection, the US will be violating the fair-trade rules.³⁸ This creates a substantive dilemma. If the US sticks to formal trade dispute mechanisms and nonconfrontational diplomacy, then China's systemic abuses and IP theft will likely continue. But if the US opts for more powerful unilateral tools, like additional tariffs and comprehensive technology export controls, then it could end up destabilizing the very global trade order that it claims to be enforcing and protecting.³⁹

Defend the Indo-Pacific

The third pillar of a unified grand strategy is military policy. If economic and diplomatic policy fail to deter China from seizing Taiwan, then US military policy must be robust. The US is pivoting to the Pacific, but not fast enough. There are two main policy options, and they are not mutually exclusive. The first policy alternative is to reshuffle force deployment in the Pacific theater. Currently the US uses a half-dozen major military bases within the first and second island chains. This is problematic because China has an extremely deadly and accurate ballistic missile force that would destroy 90% of the US Pacific forces within the first few days due to densely grouped assets.⁴⁰ The policy alternative is the concept of Agile Combat Employment

³⁵ Debbie [R-AZ-8 Rep. Lesko, "Titles - H.R.1016 - 118th Congress (2023-2024): Stop China's IP Theft Act," legislation, February 14, 2023, 2023-02-14, <https://www.congress.gov/bill/118th-congress/house-bill/1016/titles>.

³⁶ "Countering Unfair Chinese Economic Practices and Intellectual Property Theft - U.S.-China Technological 'Decoupling': A Strategy and Policy Framework," Carnegie Endowment for International Peace, accessed December 9, 2023, <https://carnegieendowment.org/2022/04/25/countering-unfair-chinese-economic-practices-and-intellectual-property-theft-pub-86925>.

³⁷ "'Guardrails' on CHIPS Act Funding to Restrict Investments in China May Restrict Participation in CHIPS Act Incentives | Perspectives on Innovation | CSIS."

³⁸ "Countering Unfair Chinese Economic Practices and Intellectual Property Theft - U.S.-China Technological 'Decoupling.'"

³⁹ "Countering Unfair Chinese Economic Practices and Intellectual Property Theft - U.S.-China Technological 'Decoupling.'"

⁴⁰ Cancian, Cancian, and Heginbotham, "The First Battle of the Next War."

(ACE). ACE takes the WWII concept of island hopping and expands it.⁴¹ The goal would be to construct hundreds of small forward arming and refueling points within the first island chain to allow US forces to disperse and rearm and refuel before they are targeted by China's ballistic missiles.⁴² This would be coupled with obtaining increased basing rights in Southeast Asia and the Philippines, and greatly enhancing ballistic missile defenses in the Pacific. The goal would be to complicate China's targeting, and to reduce the size of the salvos launched against US forces to allow a higher probability of interception by US forces.⁴³

The other key policy alternative is to greatly enhance the US manufacturing capability of long-range, precision guided munitions (PGMs) and to expand the US network of multilateral alliances in the Indo-Pacific. The US is woefully understocked for a hot war with a major power. Taiwan invasion wargames have shown the US running out of PGMs within the first few weeks, leading to costly engagements and huge US losses. The US must greatly enhance its defense industrial base to build more PGMs and enlist allied nations to do so as well. Multilateral partnerships will help in this regard too. More security partners in the Indo-Pacific will mean more basing opportunities and angles to project US forces, complicating China's invasion plans. The US may not have the full capability to defend Taiwan at such great distance, but Xi Jinping must doubt China's ability to take Taiwan at minimal cost.

Conclusion and Recommendations

To combat China's IP theft and the global reliance on China and Taiwan, the US must have a comprehensive trade strategy that has China as the main focal point. The US should focus on bending WTO trade rules in its favor, to combat China's abuse. If the US lobbies the WTO to partially rollback some of its open trading principles that China exploits, the US should have a strategy that includes other allied nations to support these rule changes.⁴⁴ Due to the complexity of global trade and holding China accountable, the US should ensure that US stake holders such as National Security Council and the National Economic Council be consulted to create a united and maximally effective strategy. This strategy will be driven by the President and supported by Congress. Reforming the WTO rules would allow the US to extend its technology export controls and economic protections without breaking the international trade system.⁴⁵ This would allow for stronger accountability measures taken against China and would limit their ability to steal IP and harass US firms.

On the military side of policy, reassuring Taiwan and other key regional allies is critical. The US cannot lose its deterrence capability and must take an all of the above approach. The defense industrial base must be massively ramped up, as lessons from the Russian invasion of

⁴¹ Cancian, Cancian, and Heginbotham.

⁴² Ochmanek et al., "Inflection Point."

⁴³ Carl Rehberg, "The Future of Integrated Air and Missile Defense (IAMD) Against China," *Helm's School of Government Conference - American Revival: Citizenship & Virtue*, May 11, 2023, https://digitalcommons.liberty.edu/hsgconference/2023/foreign_policy/14.

⁴⁴ "Countering Unfair Chinese Economic Practices and Intellectual Property Theft - U.S.-China Technological 'Decoupling.'"

⁴⁵ "Countering Unfair Chinese Economic Practices and Intellectual Property Theft - U.S.-China Technological 'Decoupling.'"

Ukraine have shown the US industrial base to be woefully atrophied.⁴⁶ At the same time, the US must push every diplomatic and security alliance it can in the Indo-Pacific as friendly landmass to base US forces is extremely scarce. Smartly dispersing forces and capabilities in the Indo-Pacific will inject doubt into China's belief that it can take Taiwan.⁴⁷ Although China has the clear advantage in an invasion scenario, its forces are untested in battle and their technological modernization is not yet complete.⁴⁸ Strengthening and adapting US force posture in the Pacific will be the key to stop the erosion of US influence and deterrence. Finally, there must be a credible threat of the US inflicting massive pain upon China, and quickly.⁴⁹ Many Chinese scenarios depend on the US taking weeks to decide and mobilize, and China plans to have seized its main objectives and force capitulation before the US responds significantly.⁵⁰ Only a credible threat of force by the US and its Pacific allies will keep Xi Jinping hesitant to seize Taiwan through force.

⁴⁶ Pavel K. Baev, "Taiwan Is Feeling the Pressure from Russian and Chinese Autocracy," *Brookings* (blog), March 16, 2023, <https://www.brookings.edu/blog/order-from-chaos/2023/03/16/taiwan-is-feeling-the-pressure-from-russian-and-chinese-autocracy/>.

⁴⁷ Cancian, Cancian, and Heginbotham, "The First Battle of the Next War."

⁴⁸ Ochmanek et al., "Inflection Point."

⁴⁹ Ochmanek et al., "Inflection Point."

⁵⁰ Cancian, Cancian, and Heginbotham, "The First Battle of the Next War."

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