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Taiwan's Strategic Role in US-China Geopolitical and Technological Rivalry

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Keywords: Taiwan, US-China, Geopolitical, Technological Rivalry, Semiconductor Chips

Authors:

Sobia Hanif: (Corresponding Author)
Assistant Professor, Department of International Relations, Fatima Jinnah Women University, Rawalpindi, Punjab, Pakistan.
(Email: sobiahanif@fjwu.edu.pk)

Bushra Haider: MPhil Graduate, Department of International Relations, Fatima Jinnah Women University, Rawalpindi, Punjab, Pakistan.

Samrana Afzal: Assistant Professor, Department of International Relations, Fatima Jinnah Women University, Rawalpindi, Punjab, Pakistan.

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Taiwan's Strategic Role in US-China Geopolitical and Technological Rivalry

Authors:

Sobia Hanif: (Corresponding Author)
Assistant Professor, Department of International Relations, Fatima Jinnah Women University, Rawalpindi, Punjab, Pakistan.
(Email: sobiahanif@fjwu.edu.pk)

Bushra Haider: MPhil Graduate, Department of International Relations, Fatima Jinnah Women University, Rawalpindi, Punjab, Pakistan.

Samrana Afzal: Assistant Professor, Department of International Relations, Fatima Jinnah Women University, Rawalpindi, Punjab, Pakistan.

Abstract

Taiwan's' emergence as a technological hub rooted in its dominance of the semiconductor industry has placed it at the heart of the US-China rivalry in the Indo-Pacific region. This research examines the impact of Taiwan's leadership in semiconductor production on the geopolitical rivalry between the two major powers. Utilizing the Neo-realist framework, the paper underscores the importance of Taiwan's centrality in defining the future of technological governance and strategic stability in the region. The research is guided by a qualitative research methodology using policy analysis and expert commentary. Findings suggest that as the US and China strive to establish control over chip production and acquire self-reliance, Taiwan's semiconductor industry will act both as a vulnerability and a silicon shield, indicating that its future security will be linked to the global balance of power.

Keywords:

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Contents

Introduction

Taiwan has experienced conflict since its initial history, whether driven by ideology or the comprehensive patterns of the Cold War. In contemporary times, Taiwan is renowned for its semiconductor industry, and has become a defining feature. Despite its small size, Taiwan is caught between two major powers (the United States and China) because of their deep regional interests. However, Taiwan was not always in this position. Taiwan was handed over from Japan to the Republic of China (ROC) after World War II ended in 1945. However, the ROC's rule was defined by corruption and brutality (the February 28 Incident), which was forcefully crushed, with at least 10,000 people killed (Jacoby, 1966). The ROC retreated to Taiwan and was on the verge of collapse after losing mainland China to the Communists. However, the Cold War redesigned strategic global interests. The US supported Taiwan with fears of communist expansion and provided aid, technology, and expertise to bolster its development (Rubinstein, 1999).

Theoretical Framework

This study uses Neorealism to explain Taiwan's strategic role in the competition between the United States and China. Neorealism posits that the international system lacks a central authority above sovereign states. Each country acts independently to maintain its survival and strengthen its power. A key idea in Neorealism is the security dilemma. When one country empowers itself, others see this as a threat and respond by enhancing their power. This causes ongoing tension, dispute, and competition. The US and China demonstrate this clearly in their rivalry over technology and influence in the Indo-Pacific region.

Taiwan's location and its semiconductor industry are very significant. Taiwan's innovative semiconductor companies supply essential components for many technologies, integrating military equipment. This makes Taiwan notable not only economically but also strategically. Neorealism helps us understand why the US and China give priority to technology and controlling supply chains. Both major powers want to keep or enhance their strength by controlling semiconductor production. Actions like export controls and investment limitations are part of this strategy.

Taiwan's semiconductor industry enhances its role in this rivalry. The idea of a "Silicon Shield" means any conflict involving Taiwan would incur high costs for major powers. This, In turn, can help to ensure Taiwan's security. Taiwan's government backs technology and production not just for the rise in economic activity but also to improve its security and position. Briefly, Neorealism explains the actions of the US, China, and Taiwan by focusing on power, security, and survival. It illustrates why Taiwan's semiconductor industry is a major part of global power politics and why Taiwan remains central in the US-China competition.

Research Methodology

This research employs a qualitative approach to examine Taiwan's strategic role amid US-China global politics and high-tech rivalry. It draws on secondary data gathered from academic journals, government official websites, online podcasts, expert opinions, and reliable news sources. Taiwan's semiconductor industry serves as a major case within the broad-scale competition. Neorealism is applied as the analytical framework to understand the critical choices of the involved states. The study incorporates a comparative analysis of US and Chinese tech policies toward Taiwan to uncover reasons and defense challenges. Limitations include the absence of primary interviews and relying solely on publicly accessible information. This approach offers a comprehensive understanding of Taiwan's significance in geopolitical dynamics.

Taiwan's Post-War Transition and Economic Rise

Stage 1: Import Substitution (1950s to 1960s): Taiwan initially focused on rebuilding indigenous industries to minimize import reliance. The Government of Taiwan established factories to fulfill domestic requirements with the help of US economic aid and land reforms. These initial steps laid the foundation for Taiwan's post-war economic transformation. Currency stabilization actions were commenced alongside economic planning to facilitate development (Hsueh, Hsu, & Perkins, 2001). Major foundational projects were launched (roads, ports, railways, education, and healthcare systems) (Li, 1976). American advisors and Christian missionaries facilitated the improvement of health and education in Taiwan. The government also imposed strict tariffs and adopted strategic economic planning, setting the groundwork for the island's industrial growth (Rubinstein, 1991).

Stage 2: Export-Driven Industrialization (1960s to 1970s): Taiwan expanded its focus globally after stabilizing its domestic infrastructure. The US has pressed Taiwan for economic self-reliance and a leaner defense budget (Taylor, 2000). To address this, Taiwan adopted the Export-Oriented Strategy in 1960, which focused on privatization, budget control, and tax reform to stimulate economic growth (Klein, 2004). Taiwan invited US companies to commence operations to attract global investment. General Instrument was the first to respond, setting the stage for increased foreign investment in the island's industrial growth (Tu, 2001). Taiwan's industrial growth accelerated due to significant US investment and technology transfer, driving economic growth and facilitating its future high-tech leadership (Greene, 2008). The impact of these policies was profound, leading to fast-paced development in key industries such as electronics, textiles, and footwear (Yum, 1968).

Stage 3: The Rise of Taiwan's Semiconductor Industry (1970s–1990s)

In the 1970s, Taiwan faced significant political and economic challenges. It broke diplomatic ties with Japan and, at the same time, lost its seat in the United Nations. During that time, the Oil Crisis of 1973 caused major economic pressure. These issues demonstrated to Taiwan that it could not rely only on cheap electronics assembly, but was required to progress toward advanced technology and innovation. Taiwan redirected its attention from basic and low-value manufacturing to science and technology under the leadership of President Chiang Ching-kuo. This fresh approach started at National Chiao Tung University (NCTU), where initial work on semiconductors began. The government's primary objective was not just to develop semiconductors, but also to build computers and

consumer electronics. Advisors like Pan Wen-yuan significantly contributed to executing this vision.

Taiwan established the Industrial Technology Research Institute (ITRI) in 1973 and the Electronics Research and Service Organization (ERSO) in 1974. These institutions were created to bring in advanced technology and spread it across the country. Taiwan signed a technology transfer agreement with the US company RCA to strengthen its technical base, and 30–40 Taiwanese engineers were sent to the US in 1976 for hands-on training in CMOS (Complementary Metal Oxide Semiconductor) technology (Wen & Chen, 2014). ITRI built a demonstration semiconductor factory in Taiwan based on RCA's design in 1977. The factory delivered more than RCA's original and achieved an 81% production yield. This success was due to cutting-edge equipment and highly skilled engineers. After this success, ITRI turned the factory into a private company called United Microelectronics Corporation (UMC) in late 1979 and officially started operations in 1982. Taiwan established Hsinchu Science Park in December 1980 near top universities like NCTU and National Tsing Hua University (NTHU) to further enhance the technology industry (Hsueh, Hsu, & Perkins, 2001, p. 167).

The local chip design companies in Hsinchu faced a big problem because they had no factory to produce their chip designs. To address this problem, Morris Chang (ITRI's chairman) introduced a new idea and created a dedicated contract chip manufacturer. This idea led to the founding of Taiwan Semiconductor Manufacturing Company (TSMC) in 1987. TSMC became a defining moment for Taiwan's economy. It helped the country become a global leader in the semiconductor industry. Taiwan's ultimate goal was to build a complete IT industry (computers, instruments, and semiconductors) and make Taiwan a center for global electronics and innovation. Currently, Taiwan's semiconductor industry has become so influential and significant that both the US and China have their eyes on it (RAND Corporation, 2004).

Stage 4: Cross-Strait Investment in China (1990s to 2000): Many Taiwanese firms, especially in labor-intensive sectors, moved operations to mainland China to take advantage of lower costs and cultural ties in the 1990s. In 1987, Chiang Ching-kuo's permission for family visits to China was a key turning point and initiated cross-strait engagement (Rubinstein, 1999). Taiwanese IT producers started to invest considerably in Chinese factories, particularly in regions like Fuzhou, Xiamen, and Putian. Afterward, indirect trade and technology partnerships with China were legalized in 1989. President Lee Teng-hui introduced the "Go South" policy to minimize escalating dependence on the mainland. Taiwan had emerged as an international leader in PC, integrated circuit (IC), and semiconductor production by the late 1990s (Hsueh, Hsu, & Perkins, 2001).

A Nation Reborn Through Planning and Partnership

Taiwan's transformation from a war-affected island into a tech giant is a testament to strategic policymaking, future-oriented leadership, and effective global partnerships. Leaders like Li Kwoh-ting**,** considered the father of Taiwan's' economic miracle were instrumental in molding the nation's development blueprint, while the guidance of Chiang Kai-shek and Chiang Ching-kuo provided a clear road map during critical decades. Support from the United States including financial aid and corporate investment significantly contributed to accelerating growth. The determination and resilience of the Taiwanese people turned ambition into achievement. By the dawn of the 21st century, Taiwan had firmly established itself as a semiconductor leader, with companies like TSMC and UMC at the forefront of the global technology supply chain (Li, 1976).

Taiwan's Strategic Role and Its Semiconductor Manufacturing

The US-China competition, characteristic of 21st-century geopolitics identifies a crucial flashpoint in Taiwan—a crucially relevant center of technology and trade, and a symbol of clashing global perspectives. Taiwan is not officially recognized as an independent state, but the United States is Taiwan's most devoted supporter (Hwang & Huang, 2023). The US has sold weapons to Taiwan worth a billion dollars, including helicopters, high-tech fighter jets, next-gen hypersonic missiles, and underwater vessels. US ships patrol the Taiwan Strait at least once a month (Chen, Lin, & Lien, 2021). In October 2022, US President Joe Biden publicly stated that the US would defend Taiwan at all costs if China launched an attack (Reuters, 2022). The US might confront China's advanced and strong military over Taiwan because of China's geopolitical setting. With a 14,000 km coastline, China has main ports like Hong Kong, Shenzhen, and Shanghai, which are important for its economy (Gray, 2011). These coastal areas connect to the global trade network, equipping China's worldwide exports (Hu & Meng, 2023).

China's maritime routes particularly those in Western Pacific and Southeast Asia are surrounded by Japan, the Ryukyu Islands, and the Philippines. More so, the critical chokepoints such as Malacca Strait and Sunda Strait are influenced by the naval presence of the US or its allies. The US-designed this strategic positioning in the 1950s to hold leverage in the Pacific (Ho, 2024). Consequently, in case of a conflict, the US and its partners could limit China's sea routes through chokepoints, disrupting its

economic lifeline. At the same time, Taiwan remains a major terminal to constrain China's control over the Pacific (Ross, 2002).

Another compelling reason is Taiwan's status as the world's leading producer of high-end semiconductor chips which are responsible for managing complex functions such as machine learning and neural-based decision-making. Without them, AI would be limited to theoretical concepts with no practical application (Samuelson, 1948). These chips are used in consumer appliances and defense systems. Taiwan produces approximately 65% of the world's semiconductor chips (Taiwan Semiconductor Manufacturing Company Limited, 2020) with TSMC as the leading company. If Taiwan were to fall under China's influence, China would gain access to a vital resource that is the foundation of advanced technologies essential to modern defense capabilities (Tsang, 2023). Such a scenario could set China to be the global leader in the military sector. Given that China relies heavily on Taiwan for semiconductor chips, with about 60% of the world's chip demand coming from China (Hamil, 2023) and Taiwan's semiconductor trade comprising 50% of its total trade with China, any disruptions in the supply of the semiconductor chips would have significantly adverse impacts on China.

Consequently, Taiwan is a key player in the large-scale adoption of AI worldwide (Baumann, Heinemeyer, Staiger, Topfer, Unger, & Muller, 2001). It is not just a producer of advanced AI servers and high-end chips but rather functions as the spinal cord of the worldwide AI infrastructure. For instance, EDIA has become the leading industry player in Microsoft. The international AI infrastructure is dependent on Taiwan to produce its latest AI servers and high-end chips (Bobek, Kempf, Scarlat, & Horvat, 2023). After the US constrained the export of AI-driven chips and elements to China in 2022, increasing Chinese dependence on Taiwan for developed and latest AI servers, this factor positioned Taiwan as an essential actor in the global AI supply chain but also increased its vulnerabilities amid increasing geopolitical tensions.

Strategic Importance for the US

The United States' dependence on Taiwan's TSMC (Taiwan Semiconductor Manufacturing Company) for innovative semiconductors presents a crucial state security challenge. TSMC provides the bulk of high-end semiconductors fundamental for AI, defense, and other dual-use technologies as the dominating factor in producing cutting-edge microchips. This dependency triggers major security concerns in light of growing geopolitical tensions in the Indo-Pacific, most significantly the threat of Chinese aggression against Taiwan. A conflict may disturb the balance of the cross-border supply network for semiconductors and interrupt growth in AI development (Glaser, Bush, & Green, 2022). A Bloomberg Economics report projects a conflict involving Taiwan may be priced at $10 trillion creating disruptive waves for global production. (Bloomberg Economics, 2024).

To minimize these threats, the US government enacted the CHIPS and Science Act of 2022, allocating $52.7 billion toward revitalizing indigenous semiconductor manufacturing (Denamiel et al., 2025). These investments strive to regain the United States' global leadership in high-end chip production, vital to countering China's growing tech power. The main elements of this strategy involve the construction of innovative chip fabs by TSMC and Intel in Arizona designed to establish a secure domestic capacity for chip fabrication. Taiwanese companies are shifting production facilities to countries and regions like Mexico, Southeast Asia, and the US. To counter these perils and vulnerabilities, TSMC is relocating its factories to Arizona, Japan, and Germany. The AI Chip Act was also passed in the US and facilitated significant assistance to Taiwanese companies to continue AI chip manufacturing locally (Peters, 2023). Repositioning Taiwan's high-tech industry is still a long-running struggle, and it would take years for other states to catch up. These steps illustrate how economic and state security interests are progressively interconnected. The world's innovative companies remain significantly dependent on Taiwan for AI components. This underscores Taiwan's fundamental role in the AI competition between the US and China (Al Latief, Mahroza, Priyanto, Widodo, Sutanto, Patmi, & Yudho Prakoso, 2024). The US reaction to semiconductor reliance involves a layered approach, enhancing indigenous capacity, protecting crucial technology, and cultivating tech collaborations. This strategy establishes semiconductors not just as economic resources but as instruments of geopolitical dominance in the emerging era of technology-led national strategy (U.S. Department of Commerce, National Institute of Standards and Technology, 2023).

China's Concerns and Strategic Calculations

China's aim to attain semiconductor self-reliance is a fundamental part of its long-term plan to establish global leadership in technology and ensure national strength. Beijing has dedicated substantial resources to its domestic semiconductor industry, under the "Made in China 2025" industrial policy and the earlier Medium and Long-Term Plan for the Development of Science and Technology (2006–2020). The creation of the Big Fund reflects China's urgency to close the technology gap, capitalized with over 343 billion yuan, along with significant tax reliefs and cross-border mergers and acquisitions (Shen & Wee, 2023).

However, China remains highly reliant on Taiwan's TSMC to produce high-end chips. TSMC's dominance in cutting-edge production (AI, quantum computing, and defense technologies) creates a defense gap for Beijing. The United States passed the CHIP ACT in October 2022, imposing limitations that block China's access to high-end semiconductor microchips from Taiwan-based firms like TSMC (Blevins, Grossman, & Sutter, 2023). By doing so, The US has cut off Chinese firms such as Huawei's Hi Silicon and SMIC from critical advanced chip-making inputs by using the Foreign Direct Product Rule (FDPR). China's way forward includes a redoubled focus on domestic innovation and production, state-led tech advancement, and a chance of indirect escalation in the Taiwan Strait (Lee & Nellis, 2022). Yet the path remains vulnerable and uncertain. China's leading firms cannot yet manufacture chips below 7nm at scale without access to extreme ultraviolet lithography from companies like ASML.

The restriction of China's access to TSMC technology has, paradoxically, eroded the deterrent power of the so-called 'silicon shield'; the idea that mutual dependence on TSMC would act as a balancing factor against conflict. The US export limitations have drastically reduced the strategic cost for China of disrupting TSMC operations in the event of a confrontation (Tech in Asia, 2025). Chinese military activities near Taiwan and tougher rhetoric from its leadership have increased fears of forced unification if diplomacy fails. The semiconductor high-tech race is not just a matter of economic policy but a test of 'national destiny' for China. Taiwan's control over TSMC technology is at the intersection of technological rivalry, historical memory, and military confrontation, making it one of the most dangerous flashpoints in the contemporary international order.

Table 1

TSMC Semiconductor Exports by Country (2024)

Country/Region	Revenue Share (%)	Key Clients	Notes
United States	65%	Apple, Nvidia, AMD, Qualcomm, Intel	The US is TSMC's largest market. Apple alone contributes 25% of revenue. Nvidia is also gaining shares rapidly[2].
China	12%	Huawei (before sanctions), Media Tek, SMIC	Shares dropped due to U.S. export controls, especially affecting Huawei.
Taiwan	7%	Media Tek, Real tek, Nova tek	Stable demand from local chip design companies.
Japan	6%	Sony, Renesas, auto industry	Consistent revenue from the automotive and industrial sectors.
Europe & Others	10%	STMicroelectronics, Bosch, and others	Includes European demand, especially from auto and industrial clients.

**Table Reference-(Stock Dividend Screener, 2024)*

The Way Forward

Taiwan's influence in the semiconductor sector is profound because of its sensitive geopolitical position and its technological superiority. It is at the heart of the amplifying high-tech competition between the United States and China and requires a logically balanced and strategic approach. Taiwan must invest strategically to strengthen its resilience amid rising geopolitical tensions. Innovating semiconductor production will sustain its "Silicon Shield" and international high-tech leadership (Tsang, 2023). Advancing domestic supply chains and leveraging technology diplomacy to build global partnerships will further improve Taiwan's strategic position.

Establishing stable and cooperative semiconductor supply chains is necessary for the United States and its allies. Rather than pursuing full economic decoupling from China, the focus should be on reducing strategic risks (Peters, 2023). This strategy focuses on strengthening supply chains among trusted partners to secure long-term strength and security. A primary element of this approach is deepening cooperation with Taiwan, particularly in semiconductor manufacturing (U.S. Department of Commerce, National Institute of Standards and Technology, 2023). The US and its allies should build sustainable partnerships with Taiwan in research and development, digital security, and human capital development to sustain the integrity of their semiconductor ecosystems, and also maintain multilateral frameworks incorporating countries like the EU, Japan,

and South Korea. These collaborations should aim to create mutual norms around export controls, supply chain safety, and the stable progress of emerging technologies. Ensuring stability in the Taiwan Strait is essential, as conflict could trigger severe economic disruption. Diplomatic and security efforts of the US and its allies can help build a secure and collaborative high-tech infrastructure (George, 2020).

China requires a balanced approach to strengthen its position in the global semiconductor landscape that balances its state ambitions with broader global integration (Tung, 2024). China should focus on its domestic capacity building by acknowledging the current shortcomings in achieving full independence in high-end chip manufacturing while advancing the goals of the "Made in China 2025" initiative. Moreso, realizing that maintaining constructive engagement with global suppliers can help sustain innovation and access to crucial technologies. However, minimizing geopolitical tensions through diplomacy will be essential. Resolving geopolitical tensions with Taiwan could ease regional anxieties and also provide options for constructive dialogue with other global stakeholders (Hamil, 2023).

Conclusion

Taiwan's transformation from a war-affected economy to the center of the global semiconductor supply chain reflects decades of strategic planning, innovation, and perseverance. Taiwan has not only revived its economy but also redesigned the dynamics of international technology. However, this leadership places Taiwan at the center of escalating tensions between the two major global powers. The United States strives to ensure its high-tech advantage and reduce its dependence on foreign production, while China views Taiwan through both strategic and political lenses, driven by ambitions of reunification and self-reliance in technology. Taiwan's semiconductor industry serves both as a shield and a point of geopolitical friction (Miller, 2022). The US and its allies are backing Taiwan's role while enhancing their capacities and committing to stable supply chain partnerships. China would benefit from minimizing tensions and taking a practical approach that prioritizes international cooperation. Taiwan's semiconductor sector is not just a national asset; it is an international priority and therefore needs to be safeguarded through international cooperation and diplomacy.

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