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China – US. Relations: Strategic Competition in the Manufacturing of Semiconductors and the Status of Taiwan

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Abstract

Of all the active conflicts and disputes in the world, the most dangerous are those with the potential to trigger a wider regional or global conflict. In order to understand where these conflicts may originate and how they might be set off, we must analyze these potential "fault lines" in order to identify the dangers and act accordingly. In this paper, through a qualitative and quantitative analysis of the factors impacting the disputed territory, we will attend to understand the Taiwan issue, the factors which may cause or prevent an armed conflict, and how we can expect it to evolve in the future. This is a dispute which has the potential to bring two superpowers into direct armed conflict with one another and trigger a global economic crisis. As a result, it may be in the best interest of all sides involved to prefer the diplomatic approach.

Keywords: Economic warfare, Geopolitical Competition, Semiconductors, Technological Dominance,

Taiwan Strait.



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Introduction

When the Chinese Civil War ended in 1949 and the Communist Party led by Mao Zedong emerged victorious and gained control of the country, the losing side, the Kuomintang, led by Chiang Kai Shek fled to Taiwan. While the Communist Party had succeeded in bringing the entirety of mainland China under its control, the nationalist party continued to claim to be the true government of China from Taiwan. Although many Chinese leaders have expressed a desire to bring Taiwan back under their sphere of influence and reunify the country, the dispute has persisted and remains unresolved today. As a result of China's growing prominence in the geopolitical system, many countries around the world have refused to recognize Taiwan as an independent state. While this has not stopped the island from developing a modern economy and democratic political system, the threat of a Chinese invasion is always looming. So, why is the political status of Taiwan so important to China? What has allowed Taiwan to maintain its sovereignty? How likely is a Chinese invasion of Taiwan? In my opinion, the Taiwan dispute will not result in an invasion or an escalated conflict between China and the West but rather will be resolved diplomatically over the course of time.

Literature Review

Taiwan is a highly developed free-market economy and is the 21st largest in the world by purchasing power parity. Since the end of the Civil War in 1949, the country has, through massive investments from the United States, rapidly industrialized and modernized its economy. Between 1951 and 1962, more than 30% of the foreign investments received by Taiwan came from the United States which, along with strong government planning and the availability of education, allowed its economy to grow at an average rate of 9.21% each year (Wang, 2014). Unlike many developing nations, Taiwan had a head start as, before the Civil War, it was a popular destination for wealthy and well-educated Chinese people who came and settled on the island during the time of the Qing dynasty. Over time Taiwan shifted away from cheap and labor-intensive manufacturing towards heavy industry and infrastructure. By the 1980s the country's economy had become more and more open and the government began to move towards the privatization of government enterprises. So, while Taiwan's economic development mirrors China in many ways, the overall GDP of the island remains limited by its small size and population. Despite this, both China and the United States seem intent to keep Taiwan in their own respective spheres of influence. According to experts such as Shattuck, this is for one simple reason, the crown jewel of Taiwan's economy: the manufacturing of semiconductors (Shattuck, 2021).

The strategic competition for control of the global semiconductor industry has already begun. In 2023, at the Global Security Forum in Qatar, a former national security advisor to the Trump administration emphasized the importance of this industry by stating "The United States and its allies are never going to let those factories fall into Chinese hands" (Mann, 2023). In the minds of the American leadership, a successful invasion of Taiwan would, almost overnight, make China the global leader in semiconductor manufacturing and provide it with immense leverage to cause economic harm to the United States and its allies. By cutting off the United States from its supply of Taiwanese semiconductors, Beijing could essentially cripple the American tech industry. The severity of this risk has alarmed American policymakers and may have influenced their claims that, in such an extreme scenario, they would conduct airstrikes and destroy Taiwan's semiconductor industry themselves rather than allow this production capacity to fall under China's control (Cunningham, 2024).

Research Methodology

As a methodology, both qualitative and quantitative research methods are used with a combination of descriptive, analytic and predictive approaches. A thorough analysis has been conducted of Taiwan's economic importance by exploring the worth of its semiconductor industry, measured through its contributions to the country's overall GDP. Meanwhile the study of journal articles has contributed to the understanding of the strategic value of this industry.

Theoretical Framework

Neo-liberalism is the political philosophy which is associated with the importance of global economic integration and the values of free market capitalism. It emphasizes the interdependence that emerges between states, even geopolitical rivals, as a direct result of the economic interaction between them. When two states have a high trade volume, many of their domestic industries become mutually reliant on goods or services provided by actors in the other state. This then makes strong peaceful relations between the two states mutually advantageous for both sides. Liberal theory as a whole places a great deal of significance on the economic and technological factors which influence a state's geopolitical decision making. More often than not, economic factors will play a major role in urging a state to engage in aggressive actions. The opposite is also true in that states will often be disincentivized from aggression due to economic implications. In my opinion, such is the case for both China and the United States in the context of the Taiwan dispute.

Due to its highly advanced semiconductor manufacturing industry, Taiwan has given itself leverage against Chinese aggression. Due to the nature of semiconductor manufacturing and the vital importance they have in the modern global economy, Taiwan has managed to align itself with the economic interests of the United States. As it stands, neither the US nor China can afford a disturbance in the global supply of semiconductors. Due to these factors, a military conflict over Taiwan is unlikely in the short term, however this does not mean an end to Chinese ambitions towards reunification. Rather, it can be argued that the military support extended by the United States to Taiwan is conditional on its ability to maintain its monopoly on semiconductors, which is highly unlikely in the long term. Over the past two decades, both the United States and China have increased investment in their own semiconductor industries and are likely to surpass Taiwan's production capacity within the next 50 years. Once this happens, the United States will no longer have a vital interest in defending Taiwanese political autonomy.

Semiconductor Manufacturing

The Semiconductor industry has come to form a major part of Taiwan's economy. Due to its capabilities in OEM wafer manufacturing and possessing a complete supply chain wherein all the necessary components are produced domestically, the country has been able to rise above all its competitors in the industry. Taiwan Semiconductor Manufacturing Company (TSMC) and United Microelectronic Corporation (UMC) are the two largest producers of semiconductors in the world, and both are based in Taiwan. By constantly putting out new innovations which have allowed them to stay ahead of their competition, such as the developing of the fabless foundry model in 1987 which revolutionized the global semiconductor industry, Taiwan has rapidly increased its share of the market. By 2007, the country surpassed the United States in the production of semiconductors and by 2020 it accounted for more than 50% of the global market (Meskhidze, 2024).

For a country like Taiwan, semiconductors are the perfect investment to maintain their value in the international market. Semiconductors have gained an unprecedented level of importance in our daily lives and are one of the essential components in just about every piece of electronic equipment that we use in our daily lives ranging from our computer to our phone to our television

remote. As a result, even a minor disruption in the supply of semiconductors would be catastrophic for the global economy which has come to run on electronics. Moreover, the nature of semiconductor production makes it so not every country with the capital to invest can open a factory and begin manufacturing them. The factories that they are produced in each cost between \$10-20 billion and can take up to five years to construct. Semiconductors require a completely sterile environment to be produced properly, something which can be very difficult to achieve in a standard factory setting. Moreover, even if a state has the capital investment and technical knowledge required to build a semiconductor production facility, the fabrication of a single semiconductor can take almost 4 months (VerWey, 2019). This means that any country or corporation wishing to enter the semiconductor industry will be forced to operate on a loss of billions of dollars for several years before they can potentially make profits; a very risky investment considering how quickly technological advances can make previous manufacturing techniques obsolete. So, due to this multitude of reasons, Taiwan has effectively gained a monopoly over the global semiconductor industry which has allowed its economy to flourish, and more importantly, has given the island a very significant strategic value. Under these circumstances, it would be fatal for either the United States or China to allow the other to gain complete influence over Taiwan as they would risk being cut off from the supply of semiconductors. It is precisely for this reason why the United States, despite refusing to officially recognize Taiwan as an independent state, has continued to support the island politically and even militarily.

The Importance of Semiconductors

During the Covid-19 pandemic, many businesses ranging from consumer goods and services to manufacturing were disrupted by the lockdowns. As a result, the global supply chain underwent a crisis which saw a shortage of various goods including common household items. Aside from businesses and offices, factories were also closed. This included factories which manufactured computer hardware. Much of this hardware was used in manufacturing computer chips. The shortage of chips then triggered a ripple effect which caused delays in manufacturing which caused the prices of items such as cars, household appliances, and computer parts to skyrocket. At the time of the pandemic, these effects were not highlighted by public attention as the supply shortages were not limited to items that relied on computer chips and the global economy saw rising prices for nearly all commodities. However, in hindsight we can see that even the slightest disruption in the supply of chips was enough to disrupt the manufacturing of thousands of commodities. If Taiwan's capacity to manufacture semiconductors was impacted in a more drastic way which rendered it unable to produce chips for several years, the result would be catastrophic. The Covid-19 pandemic provides us with a valuable lesson in terms of how fragile the modern global economy is. Disruptions in supply for one item or commodity can have a ripple effect that can cause exponentially greater damage to the economy as a whole. When this disruption impacts a commodity that is used in manufacturing so many other commodities, the crisis is further exacerbated. Both China and the United States learned this valuable lesson from the pandemic and have taken measures to prevent it from being repeated. Incentivized by the United States, Taiwanese companies have begun setting up new foundries and fabrication plants overseas, particularly in the United States. Three new facilities in Arizona which cost a staggering \$65 billion, have seen a great number of challenges in their operationalization. Due to factors such as labor rights and a lack of access to skilled and experienced engineers, Taiwanese and American companies are struggling to replicate the success of TSMC (Mark, 2023). This means that even with Taiwan's complete monopoly of the market and the existing difficulties in setting up indigenous semiconductor manufacturing, there are more problems to overcome before the United States can reduce its reliance on Taiwan for computer chips. Semiconductors are known for requiring completely sterile laboratory conditions in order to be manufactured. It seems that the political and economic conditions for building and operating these foundries is an even greater barrier to entry. These factors among others show us that, in hindsight, Taiwanese leaders' decision to invest so greatly in semiconductor manufacturing may have been the best strategic decision they could have made in order to ensure their autonomy and ability to resist reintegration into mainland China.

China's Stance

The period of time between 1839 and 1949 saw China fall from being one of the most powerful economies in the world to the complete subjugation of the Qing dynasty at the hands of European powers. These Western states, particularly the British, Dutch, and Portuguese, exploited China through military force by imposing harsh trade deals which were ultimately more profitable to themselves. Events like the Opium Wars and the secession of Hong Kong to the British explain why this time is now referred to as the "Century of Humiliation". This term was coined in the early 20th century by Chinese nationalists in opposition to Japanese imperialism and has since become a part of the country's political history. Politicians and leaders around the country have used the term as a political tool to show the people that they are always at risk of regressing back into the stagnation and being left open to exploitation, and nowhere is this truer than in the case of Taiwan (Kaufman, 2010).

In the mind of the Chinese people, the secession of Taiwan and the resultant separation of the country is a leftover scar of the century of humiliation. A wrong which can only be righted through reunification. While Taiwan has a great deal to offer in terms of its economic significance, the true aim of the Chinese government is the symbolic victory that comes with reunifying mainland China with what they perceive to be a rogue province and a direct threat to their political authority. By reunifying mainland China with Taiwan, whether through diplomatic or military means, the Communist Party aims to frame the issue through the lens of nationalism and inspire patriotic fervor and support for its regime. The crux of the Party's legitimacy amongst the Chinese people is its successful economic policies which have, in the eyes of the people, restored China to its natural place as one of the cornerstones of the global economy. By bringing Taiwan back under Chinese control, the government would be able to show the people that they have thrown off the yoke of foreign interference in the country's affairs and, in doing so, gain a great deal of support. In these efforts, the current Chinese leader, Chairman Xi Jinping, has, on multiple occasions, stated that reunification with Taiwan must be achieved and, while it should be achieved peacefully, the use of force has not been ruled out. These statements have been followed by a record number of violations of Taiwan's Air Defense Zone by the PLAAF (Rafatjoo, 75-79).

While Chinese claims in favor of reunification provide an understanding of the political motivation of the Chinese leadership, we must also analyze the military and economic factors which may move them towards or away from direct conflict and an attempt at forced reunification. As mentioned previously, Taiwan currently holds 60% of the global market share for semiconductor manufacturing and with the existing constraints on developing a domestic industry, it is unlikely China can make up the difference in the short term. So, it can be reasonably concluded that any military conflict over Taiwan will have some impact on the supply of semiconductors, and therefore on the global supply chain of almost every industry which relies on computing, practically every industry in the modern global economy. The risk of damaging Taiwan's foundries is immense considering they cannot be replaced in the short term. This risk is further exacerbated by Taiwanese and American claims that they would rather destroy the foundries themselves rather

than allow them to fall into Chinese hands. Therefore, a Chinese invasion of Taiwan is expected to create a global economic crisis, one which may last up to 10 years and will disproportionately harm the production and further development of emerging technologies in the field of computing and robotics (Bown, 2020). This "Tech Winter" would drastically slow or completely stop the large scale development of more efficient computer hardware and new technologies such as artificial intelligence. All in all, the economic damage caused by an overt attempt at reunification would be in the tens of trillions of dollars.

The United States' Interests

To understand how much potential there is for a conflict between the United States and China over Taiwan, we must have a deep understanding of what each side hopes to gain. As mentioned previously, the Chinese government hopes to gain support and legitimacy from its people by giving them a symbolic victory which is significant in the context of the century of humiliation. The United States, on the other hand, seeks to bolster its military presence in the Indo-Pacific region as well as protect what it considers a bastion of democracy and liberal economics in East Asia. Meanwhile, both sides are simultaneously competing for influence over Taiwan's vital semiconductor industry which has the potential to reshape the economic balance of power between them. But what does Taiwan want? Surprisingly, polls conducted on the island show that many people prefer the status quo and, while they overwhelmingly reject reunification with China, there is not a great deal of support for a formal declaration of independence and sovereign statehood.

While China continues to make threats and press the issue of Taiwan, many experts question whether the country is even militarily capable of invading the island. Many military leaders and strategists have likened Taiwan to a natural aircraft carrier. The Taiwanese government possesses cutting edge military equipment courtesy of the United States and its western allies and has had over half a century to reinforce the island against any potential amphibious assault. So, any invasion by China will not be an easy task. This difficulty is only exacerbated by the potential for the west to get involved directly, more likely through providing military equipment rather than actually participating in combat, much like what it is doing in Ukraine right now. Therefore, it is unlikely that China, despite its posturing and aggression, is willing to destabilize the region and jeopardize its own economy by provoking the west. On the other hand, should Taiwan be forced to fight alone without any help from its western allies, the strategic calculus becomes much simpler for Beijing.

So, if the only thing preventing China from forcibly reunifying with Taiwan is the latter being backed by the United States, then in order to understand how this conflict will come to a resolution, we must analyze the US interests which have caused it to back Taiwan in the first place. Despite the inherent symbolic value of providing political and military support to a fellow democratic, free market state, it seems unlikely that the United States would prioritize this over its relationship with China, the country which manufacturers a significant portion of its consumer goods. Therefore, we can reasonably conclude that the United States' key interest in Taiwan is based on its aforementioned semiconductor industry. While it is true that Washington cannot afford to give up the world's largest source of semiconductors to one of its main geopolitical rivals, this may not be the case forever. Over the last 10 years, both Beijing and Washington have recognized the economic and, more importantly, the strategic value the semiconductor industry will have in the future and have begun investing heavily into it. China's State Council has set a goal of becoming the global leader in the industry by 2030 and the United States has sought to expand its own domestic production of semiconductors through contracts with corporations like Samsung (Peters,

2022). So, while Taiwan's near monopoly of the industry gives it strategic value in the present, this may not last long.

Of course, the opposite is also true. Since Taiwan has historically had strong relations with the United States due to their economic interdependence and defense ties, naturally many of its actions are influenced by the United States. While the foundries themselves are located in Taiwan and the corporate and political leadership which controls the production of the semiconductors themselves are Taiwanese, many of the technologies and manufacturing techniques which are used are the intellectual property of American companies. This is largely due to the fact that research and development of these technologies and techniques were done through American funding. As a result, a trend has emerged wherein Chinese companies will find themselves cut off from Taiwanese facilities as companies such as TSMC and UMC have been forced to comply with export bans on American intellectual properties, restrictions that become more and more strict by the year as the trade war between the United States and China escalates. While the Biden administration was not quite as aggressive, the incoming Trump administration has made it no secret that they will seek to continue the strategy implemented during his first time in office of utilizing economic pressures against both rivals and allies alike. How this will influence China's stance remains to be seen, however it is reasonable to assume that Chinese companies will have less access to American and Taiwanese manufacturing techniques and will risk falling behind.

How the Conflict Will Evolve?

While neo-liberal theory tells us that states with high levels of economic interdependence are unlikely to engage in direct conflict with one another, realist theory tells us that states will seek to grow their own power. Right now, and in the future, at least in the short term, both the United States and China are disincentivized from aggression in the Taiwan Strait. China, by attempting an invasion of Taiwan, would disrupt the global supply of semiconductors and inflict immense economic harm upon itself. In the same vein, the United States, by overtly supporting complete Taiwanese independence from mainland China, would force China to escalate the conflict in the immediate future, thereby disrupting the supply of semiconductors which would harm American economic interests. It seems that both sides have found themselves in a situation where the balance of threats posed to one another means neither side is willing to be aggressive, at least in the military domain.

So, assuming the conflict will not escalate in the short term, what are the long term implications for Taiwan? As both sides continue to develop their own domestic production of semiconductors, Taiwan's importance in the strategic calculus will be diminished. While Taiwan currently has the advantage technologically, many of its developments were achieved through American funding which is increasingly being focused back towards increasing the United States' own production capabilities. While Taiwan will continue to play an important role in the industry for the foreseeable future, the complete monopoly it holds now cannot be held perpetually in the face of American and Chinese resources. Once the two superpowers' production capability increases past a certain threshold where they believe that a disruption in the Taiwanese manufacturing of semiconductors will not result in a global economic crisis, they will become increasingly more aggressive (Chou, 2023).

Based on the arguments and reasoning given above, we can conclude that the Taiwan dispute is in a state of "hibernation", one whose outcome will be determined in the future. However, if this is the case, why do global media outlets and even some geopolitical experts and analysts claim that the Taiwan Strait is one of the most significant potential flashpoints for an overt conflict between

the United States and China? The answer to this question lies purely in perception. Constructivism tells us that the interactions between various actors and groups can be defined by the prevailing social norms. These norms are usually established over a long period of time. In the same way, we can consider the current geopolitical boundaries established by modern nation states as a norm which has been established. By allowing Taiwan to continue governing itself, the Chinese leadership faces a risk of global perceptions towards Taiwan being that of an independent nation. In the modern globalized world, the perceptions and opinions of people around the world matter a great deal. If China, decades from now, carries out an invasion of a Taiwan which is seen by global audiences as an independent nation, it will do so against popular opinion and risk being economically and politically ostracized by the Western world. In order to prevent this, China seeks to "keep the conflict alive" in the minds of both global and domestic audiences. Many of the aggressive stances taken by Chinese political leaders and even some of the actions taken by the Chinese military, such as the repeated violations of Taiwanese airspace, may have been calculated with the intention of creating headlines and alarm without actually triggering a conflict. This creates the perception of an active conflict and a political dispute which prevents Taiwan from being categorized as an independent state and causes it to remain a "disputed territory".

Even the United States' actions indicate an approval of this established norm as, while it provides political, military, and economic support to Taiwan, it has consistently refused to recognize Taiwan as an independent state. How this stance will evolve in the future will be influenced by a multitude of factors. As the economic importance of Taiwan decreases, the United States' stance will increasingly shift based on its overall strategic goals in the Asia-Pacific region. Currently, the United States has employed a strategy wherein it has sought to empower regional allies and partners such as Japan, Australia, and India in order to contain the spread of Chinese influence. Much like the collapse of the Soviet Union, the United States is seeking to defeat China by employing economic means while preventing its territorial expansion. When the economic balance of threat over Taiwan is no longer as vital, it is entirely possible that the United States may be in favor of a diplomatic negotiation which allows China to peaceful regain control of Taiwan. This could even be leveraged for China relinquishing several of its other territorial claims in the South China Sea such as its claims against Japan over the disputed Senkaku Islands.

Conclusion

The Taiwan dispute is a complicated issue which has increasingly come to exemplify the nature of China's foreign policy in the 21st century. This dispute is the result of their shared history which has caused many in China to view the island as a rogue province which must be brought back under their control. The primary reason this dispute has persisted as long as it has is due to Taiwan's strategic importance as one of the primary global suppliers of semiconductors. Its dominance in the industry has provided it strategic value which has preserved its freedom from Chinese rule so far. However, with both the United States and China mobilizing their economic and technological capabilities to develop their own domestic semiconductor manufacturing industries, it is increasingly likely that Taiwan's strategic value will become obsolete in the coming decades. Once the United States no longer has an economic and strategic interest in Taiwanese independence, it is highly likely that Taiwan will be forced to seek a diplomatic solution which involves reunification with China. Moreover, because the Chinese leadership is well aware of the situation, it is highly unlikely that, despite its posturing and aggression, it will launch a costly invasion of the island. The Communist Party has gained a reputation for planning in the long term, which may be exactly what it requires to achieve its reunification with Taiwan.

Recommendations

Due to their economic might, both the United States and China are capable of becoming independent of Taiwan for their supply of semiconductors in the long term. Despite having a head start, the small island simply cannot compete with the production capacity these two superpowers can develop given enough time. So, if the United States no longer needs Taiwan for semiconductors, it is entirely possible that the lack of strategic or economic interest may prevent it from intervening in the event of a Chinese invasion. Should this be the case, then between this and the lukewarm response the Taiwanese people have given to the prospect of independence and sovereign statehood, China may not even need to reunify through military means. Without the prospect of support from the west, Taiwanese leaders are likely to recognize that there is little chance of resisting China and, thus, prefer a diplomatic solution.

This diplomatic solution, however, will most likely involve a peaceful reintegration with mainland China. The importance placed by past and current Chinese leaders on reunification have made it so that allowing Taiwan to declare its independence would be a grave threat to the legitimacy of the Chinese Communist Party. Whether through force, diplomacy, or economic coercion, Beijing will ultimately try to reunify Taiwan with the rest of China. Moreover, it is highly unlikely that the United States will be willing to engage in direct conflict with China, and in doing so risk a nuclear escalation, over Taiwan if it does not serve vital American strategic interests. As it stands, Taiwan's interests align with the United States. However, interests change and the United States has shown itself to be pragmatic and willing to shift alliances and support based on its interests. In my opinion, the Taiwan dispute will remain in its current state until either the United States or China determine that they can disrupt the flow of Taiwanese semiconductors without causing themselves immense economic damage. Only once this happens can a military or diplomatic solution be seriously considered.

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