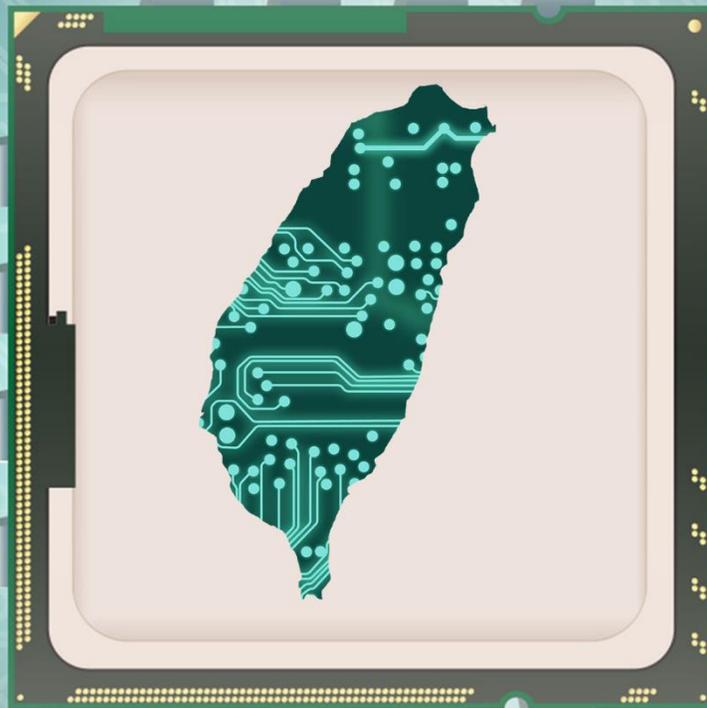


# The Prize

Why **Taiwan** and its Place in the Global Semiconductor Supply Chain Matter to the United States

By Matthew Brazil



May 2021

  
**The JAMESTOWN**  
F O U N D A T I O N  


# **The Prize: Why Taiwan and its Place in the Global Semiconductor Supply Chain Matter to the United States**

**By Matthew Brazil**



**May 2021**

## **THE JAMESTOWN FOUNDATION**

Published in the United States by  
The Jamestown Foundation  
1310 L Street NW  
Suite 810  
Washington, DC 20005  
<http://www.jamestown.org>

Copyright ©2021 The Jamestown Foundation

All rights reserved. Printed in the United States of America. No part of this report may be reproduced in any manner whatsoever without written consent. For copyright and permissions information, contact The Jamestown Foundation, 1310 L Street NW, Suite 810, Washington, DC 20005.

The views expressed in this report are those of the author and not necessarily those of The Jamestown Foundation.

For more information on this report of The Jamestown Foundation, email [pubs@jamestown.org](mailto:pubs@jamestown.org).

Front cover image: “computer chip technology power,” designed by Lovepik user 30000000242, <https://lovepik.com/image-500387747/computer-chip-technology-power.html>.

# Jamestown's Mission

The Jamestown Foundation's mission is to inform and educate policy makers and the broader community about events and trends in those societies which are strategically or tactically important to the United States and which frequently restrict access to such information. Utilizing indigenous and primary sources, Jamestown's material is delivered without political bias, filter or agenda. It is often the only source of information which should be, but is not always, available through official or intelligence channels, especially in regard to Eurasia and terrorism.

## Origins

Founded in 1984 by William Geimer, The Jamestown Foundation made a direct contribution to the downfall of Communism through its dissemination of information about the closed totalitarian societies of Eastern Europe and the Soviet Union.

William Geimer worked with Arkady Shevchenko, the highest-ranking Soviet official ever to defect when he left his position as undersecretary general of the United Nations. Shevchenko's memoir *Breaking With Moscow* revealed the details of Soviet superpower diplomacy, arms control strategy and tactics in the Third World, at the height of the Cold War. Through its work with Shevchenko, Jamestown rapidly became the leading source of information about the inner workings of the captive nations of the former Communist Bloc. In addition to Shevchenko, Jamestown assisted the former top Romanian intelligence officer Ion Pacepa in writing his memoirs. Jamestown ensured that both men published their insights and experience in what became bestselling books. Even today, several decades later, some credit Pacepa's revelations about Ceausescu's regime in his bestselling book *Red Horizons* with the fall of that government and the freeing of Romania.

The Jamestown Foundation has emerged as a leading provider of information about Eurasia. Our research and analysis on conflict and instability in Eurasia enabled Jamestown to become one of the most reliable sources of information on the post-Soviet space, the Caucasus and Central Asia as well as China. Furthermore, since 9/11, Jamestown has utilized its network of indigenous experts in more than 50 different countries to conduct research and analysis on terrorism and the growth of al-Qaeda and al-Qaeda offshoots throughout the globe.

By drawing on our ever-growing global network of experts, Jamestown has become a vital source of unfiltered, open-source information about major conflict zones around the world—from the Black Sea to Siberia, from the Persian Gulf to Latin America and the Pacific. Our core of intellectual talent includes former high-ranking government officials and military officers, political scientists, journalists, scholars and economists. Their insight contributes significantly to policymakers engaged in addressing today's newly emerging global threats in the post 9/11 world.

# Table of Contents

<b>Executive Summary</b> .....	1
<b>Introduction</b> .....	2
<b>Strategic Balancing and Worries in Asia</b> .....	3
<i>Figure 1: China’s First Island Chain Maritime Chokepoints</i> .....	5
<b>Shifting Regional Influence</b> .....	5
<i>Table 1: ASEAN Member States Elite Polling on Preference to Align with China or the U.S.</i> .....	6
<b>All Means Short of War</b> .....	7
<i>Figure 2: Chinese and U.S. Forces Could Clash Over Taiwan</i> .....	9
<b>Invader Agonistes</b> .....	9
<i>Pesky Americans</i> .....	10
<i>Joint Operation Pains</i> .....	12
<i>The Fervor Gap and Its Dangers</i> .....	13
<b>Is Time on Nobody’s Side?</b> .....	14
<b>The Taiwan Computer Chip Conundrum</b> .....	16
<i>Semicon 101—and Taiwan’s Crucial Position</i> .....	16
<i>Table 2: Global Revenue Share of Top Ten Semiconductor Foundries</i> .....	18
<i>Figure 3: Global market share of major semiconductor companies as measured by manufacturing capability</i> .....	18
<i>War and Peace and Semiconductors</i> .....	19
<b>What is To Be Done?</b> .....	21

## **Executive Summary**

Taiwan has always played a vital role in strategic thinking on the defense of Japan and of the U.S.'s position in the western Pacific. As part of the "first island chain" that circles the Chinese coast, Taiwan would be geopolitically priceless to Beijing if under its control. Such a situation would reverse today's assumptions about the security of Japan and other American allies in Asia, as well as accelerating China's ascent toward global power.

International markets are also waking up to Taiwan's position in the global semiconductor supply chain, which is critical for the manufacture of almost all technological products, including military systems. If disabled by war or isolated under Beijing's control, the loss of Taiwan as a manufacturer of advanced computer chips would rock the world.

Even so, a comprehensive poll of elites in Southeast Asia shows a reluctance to support Taiwan in the event of outright confrontation with China. That includes not only a possible over-the-beach Chinese invasion of Taiwan, but also operations consisting of "all means short of war" meant to intimidate Taiwan into negotiating an accommodation with Beijing.

For Beijing, Taiwan exists as a constant existential threat and a rival to the legitimacy of the Chinese Communist Party's (CCP) rule over a single China. CCP General Secretary and Chinese President Xi Jinping, appears to be unwilling to leave the Taiwan issue to be resolved by future generations, and has stated his aim to "resolv[ing] the Taiwan question" to broader goals of "national rejuvenation" by the centenary of China's founding in 2049 ([Xinhua](#), October 18, 2017). While time seems to be running out for Taiwan, the clock is also ticking for the CCP: it faces near-term demographic problems and growing competition in the Indo-Pacific with the United States and other countries.

Preserving Taiwan's freedoms and the security of East Asia is in the hands of Washington, which must convince reluctant allies that collective action is necessary to prevent a hostile takeover of Taiwan and the geopolitical and economic hardships that would follow.

## Introduction

The CCP considers Taiwan (officially known as the Republic of China (ROC) to be “an inseparable part of China” and claims sovereignty over the independently administered island nation based on previous annexations and occupancies during the Qing Dynasty and briefly after World War Two.<sup>1</sup>

The 2020 U.S. Department of Defense’s China Military Power Report assessed that Chinese leaders seek unification with Taiwan on Beijing’s terms as “a fundamental condition of national rejuvenation.” Officially, Beijing seeks peaceful reunification with Taiwan, but it does not renounce the use of military force, as codified in the 2005 Anti-Secession Law ([Embassy of the PRC in the U.S.](#), March 15, 2005). The circumstances under which China would use force remain ambiguous and have evolved over time. China seeks to deter Taiwan from moving further toward independence and to prevent the United States from intervening if the People’s Liberation Army (PLA) undertakes military action to compel reunification.<sup>2</sup>

*The PRC seeks peaceful reunification with Taiwan as a “fundamental condition of national rejuvenation,” but does not renounce the use of military force to achieve its aims.*

Beijing has objected to official contact between Washington and Taipei since the 1979 normalization of relations between the U.S. and the PRC. The recent increase in American delegations visiting Taipei to express support for Taiwan has drawn rising condemnation from Beijing. “We oppose any form of official exchange between the United States and Taiwan, no matter how it is presented, no matter what excuses are used as a cover up,” said Ma Xiaoguang (马晓光), a spokesperson for the PRC State Council Taiwan Affairs Office. ([Xinhua](#), April 10, 2019).

Beijing’s sense of urgency to “recover” Taiwan has shifted at various times during the last two decades, due in part to whether it perceives the ROC government moving toward formal independence. Although the current government headed by President Tsai Ying-wen (蔡英文) of the Democratic Progressive Party (DPP) is cautious and not explicitly pro-independence, the CCP

---

<sup>1</sup> For more background on China’s historic relations with Taiwan, see: Eleanor Albert, “Backgrounder: China-Taiwan Relations,” *Council on Foreign Relations*, updated January 22, 2020, accessed April 15, 2021, <https://www.cfr.org/backgrounder/china-taiwan-relations>.

The term “renegade province,” commonly used in the English language press to refer to the PRC’s view of Taiwan, understates the CCP’s hostility. The original insulting phrase—aimed at former communists who defected to Taiwan and the Kuomintang Nationalist government—is 叛徒 (*pàntú*), which can be translated as insurgent, traitor, turncoat or renegade. By contrast, Chinese communists who have defected to foreign countries are more commonly called 汉奸 (*Hànjiān*), or “traitor to China” (literally, “a traitor to the ethnic Han Chinese”).

<sup>2</sup> Department of Defense, *Military and Security Developments Involving the People’s Republic of China 2020*, U.S. Department of Defense Annual Report to Congress, Washington D.C.: Office of Secretary of Defense, <https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF>, 3, 112, 113.

has been deeply concerned by Tsai's explicit rejection of the consensus "one country, two systems" framework since January 2019 ([Office of the President of the ROC](#), January 2, 2019). Regardless of how the ROC government in Taipei might characterize its status, a *de facto* independent Taiwan has endured for the entire existence of the PRC. But the situation in 2021 is different from before. As the military capabilities of the PLA have grown, support for an independent Taiwan, or at least for the defense of Taiwan's autonomy, have also increased—both on the island and among its unofficial allies (*The Diplomat*, [October 23](#) and [December 3](#), 2020). While seeking a rapid conclusion to any military action, the PLA also prepares for extended conflict to achieve China's objectives.

As explored below, China would gain classic geopolitical advantages by conquering Taiwan, including: achieving unhindered access to the open Pacific Ocean, where it has hitherto been blocked by the "first island chain;" gaining an advantage over China's traditional rival, Japan, by placing Chinese forces close to its southern defenses; and removing an old enemy—the ROC, which has served as an overt alternative to Chinese communist rule following its transition from a military dictatorship to a multi-party democracy in the late 1980s. Beijing's goal to project power beyond its near seas would be well-served by taking control of Taiwan's ports and naval bases.

Taiwan is also a juicier prize than ever for Beijing because it is a critical source for the world's supply of semiconductors (computer chips), the loss of which would affect worldwide manufacturing and commerce (*The Japan Times*, January 26, 2021). In the context of the current global chip shortage, Taiwan Semiconductor Manufacturing Corporation (TSMC) now controls 28 percent of the world's market by volume, and a whopping 56 percent by revenue, partly because it has cornered the market on chips powering the most advanced and expensive devices. Including the production capabilities of the island's next two major chip manufacturers, United Microelectronics Corporation (UMC) and Powerchip Semiconductor Manufacturing Corporation (PSMC), Taiwan dominated 65 percent of global chip-making market share by revenue in the first three months of 2021 ([Counterpoint Research](#), February 2; [TrendForce](#), February 24; [CNBC](#), March 15).

Because the Taiwan issue is of geo-strategic importance while also being closely tied to the PRC's existential "core" interests and the CCP's legitimacy, it is likely that Washington will never convince Beijing of the utility of a mutually acceptable solution on Taiwan. Instead, the U.S. must redouble its efforts to help allies understand that supporting Taiwan is critically important to maintaining the security of the Indo-Pacific region.

### **Strategic Balancing and Worries in Asia**

In East Asia, there is just as much—if not more—concern about the long-term implications of China's rise (and America's reaction) as there is about what will happen to Taiwan in the next few years. In response to a question from the BBC on the possibility of conflict between the U.S. and China, the Singaporean Prime Minister Lee Hsien Loong said on March 14 that:

"It (Sino-U.S. conflict) is more likely than it was five years ago, but I think the odds of a military clash are not yet high. But the risk of severe tensions which would raise the odds, later on, I think - that's considerable. Both sides think their domestic calculations are paramount...and their

external relations are based on that. Therefore, it is not so easy to say, well, the external logic compels you to work together because internal logic may impel you to take a very hard line, and you may find yourself at an impasse and clash. And that can easily happen” ([BBC via Youtube](#), March 14).

*“...Taiwan for Japan is even more invaluable than Gibraltar was for Britain, or Cuba was for America...were Taiwan to be annexed by China, the security equation that has sustained peace, prosperity and freedoms for post-WWII Japan would be fundamentally altered.”*

In an interview with the author, Professor Tomohiko Taniguchi of Keio University explains that “Taiwan for Japan is even more invaluable than Gibraltar was for Britain, or Cuba was for America,” Professor Taniguchi was a special advisor to the former Japanese Prime Minister Shinzo Abe. “Were Taiwan to be annexed by China, the security equation that has sustained peace, prosperity and freedoms for post-WWII Japan would be fundamentally altered.” Taniguchi also notes that because Taiwan is so close to Japan’s southern islands, the strategic implications of Taiwan becoming a Chinese military base are high for Japan. In the event that Taiwan fell under the control of China, the possibility of increased Japanese distrust of America (following the implied failure of the U.S.’ security guarantee to Taiwan) could cripple the U.S.-Japan Security Treaty and further undermine regional security.<sup>3</sup>

Similarly, Toshi Yoshihara, a senior fellow at the Washington D.C.-based Center for Strategic and Budgetary Assessments, explains that “Japanese strategists have always seen Taiwan as key to Japan’s southern flank” as Japan’s southernmost islands lie only 110 kilometers from Taiwan’s east coast. Taiwan’s fall “would change Japan’s perception of security. Japan’s position in the Senkakus would be untenable and [it would also be] challenged on Okinawa. So, Japan cares a lot about Taiwan.”<sup>4</sup>

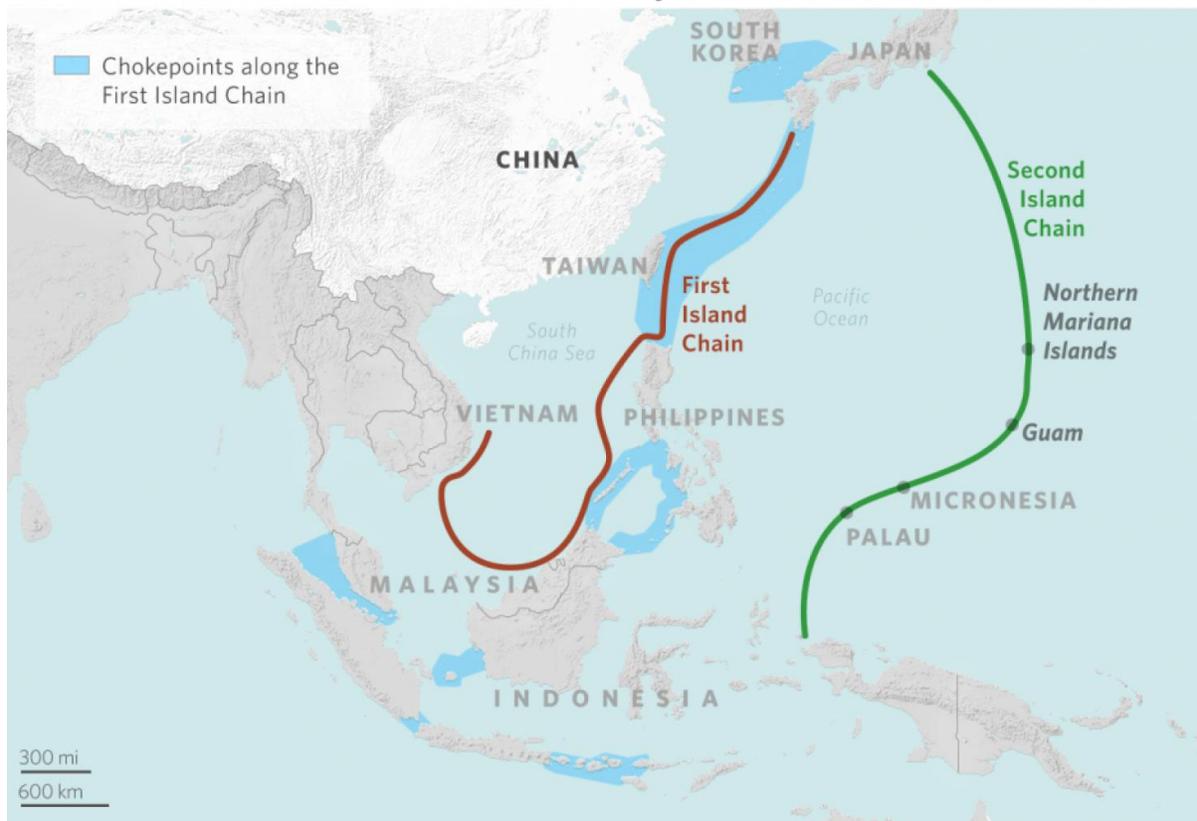
These concerns are related to Taiwan’s position in the “first island chain,” which includes the Japanese main islands, Okinawa, Taiwan, the Philippines, and Borneo. That “chain” stands as a barrier to Chinese power projection into the Pacific ([Real Clear Defense](#), May 4, 2017). Unlike the U.S., which is naturally advantaged by its unobstructed and open access to the Pacific and Atlantic oceans, China’s routes into the Pacific are channeled in between island nations (*see map below*). The geography makes it easier for foreign forces to surveil and engage oceangoing vessels and aircraft *en route* to or departing from mainland China. Because of these realities, both Japan and China care a lot about Taiwan’s status as a friendly or controllable territory. Taiwan represents a key to both countries’ future as a world power.

---

<sup>3</sup> Author’s email exchange with Professor Tomohiko Taniguchi, February 27, 2021.

<sup>4</sup> Author’s interviews with Toshi Yoshihara and Jack Bianchi on February 4 and January 31, 2021.

## China's First Island Chain Maritime Chokepoints



Source: U.S. Department of Defense, RAND Corp. (data from 2013)

POWERED BY esri Copyright Stratfor 2017

*Figure 1: A map of maritime chokepoints along the first island chain, which extends along China's coast (Image source: [Stratfor via LINE](#)).*

Pongphisoot (Paul) Busbarat, a professor of Political Science and International Relations at Thailand's Chulalongkorn University, harbors no optimism that China will ever give up its ambition to control the island province. "Taking Taiwan would be a defensive move in Beijing's eyes, as they believe Taipei is guilty of colluding with foreign powers," he says. In the event of a successful Chinese takeover of Taiwan, he warns, "We may see medium and small countries in Asia move closer to either China or the US. Moreover, this kind of situation will nicely allow Japan to have a justification for a full re-militarization and the development of nuclear capability." Considering the economic and other impacts of a Chinese attack against Taiwan, in the end "the best option may be to try to reach an agreement more on Beijing's terms."<sup>5</sup>

### Shifting Regional Influence

As Beijing's regional power grows, a loss of faith in the U.S. by its allies across Southeast Asia is focusing minds. Malcolm Cook of the Institute of Southeast Asian Studies (ISEAS) in Singapore says that elite opinion polling in the region shows that many "already view China as the hegemonic power in Asia. If Taiwan fell, all would need to find a way to get along with Beijing... it would

<sup>5</sup> Author's interview by email with Professor Pongphisoot (Paul) Busbarat, February 26, 2021.

have a major ripple effect” that would damage America’s position in Southeast Asia. A 2020 ISEAS survey polled leaders in Thailand, Vietnam, Laos, Myanmar, the Philippines, Indonesia, Cambodia, Malaysia, Singapore, and Brunei. The results show how conscious Southeast Asian elite are to the regional influence of Chinese power and should be sobering to the U.S. ([ISEAS](#), January 16, 2020).

Over 79 percent of respondents viewed China as the most influential economic power in Southeast Asia, while only 7.9 percent saw the U.S. as most influential. Almost 71.9 percent found that prospect worrying, while 28.1 percent welcomed China’s economic dominance. Meanwhile, 52.2 percent saw China as the most influential political and strategic power in the region, almost double the number (26.7 percent) who considered Washington as the most influential. Tellingly, the survey showed higher confidence in the EU’s ability to uphold the rules-based international order (33 percent) compared to confidence in the U.S. (24.3 percent), although that could change in 2021 following the presidential transition in Washington. When asked to choose between aligning with China or the U.S., America won by 53.6 percent to 46.4 percent, but that result is more complicated than it appears: the majorities of seven member states of the Association of Southeast Asian Nations (ASEAN) chose to align with China, while larger majorities in Vietnam, the Philippines, and Singapore chose the U.S. (*see table below*).

*Table 1: ASEAN Member States Elite Polling on Preference to Align with China or the U.S.*

Align with China	Align with the U.S.
Laos – 73.9% in favor	Vietnam – 85.5% in favor
Brunei – 69.1% in favor	Philippines – 82.5% in favor
Myanmar – 61.5% in favor	Singapore (61.3% in favor)
Malaysia – 60.7% in favor	
Cambodia – 57.7% in favor	
Indonesia – 52% in favor	
Thailand – 52.1% in favor	

*Source: Data from “The State of Southeast Asia: 2020 Survey Report” ([ISEAS](#), January 16, 2020).*

Finally, 72.9 percent of respondents believed either that “China is a revisionist power that intends to turn Southeast Asia into its sphere of influence” or that “China is gradually taking over the US’s role as a regional leader” ([ISEAS](#), January 16, 2020).

An increasing reticence in Asia to support Taiwan’s status quo could signal a broader loss of support for Taiwan outside the United States. That, plus the growing military power of the PRC, coupled with the CCP’s apparent belief that the U.S. is in decline, could lead Beijing to believe that time is on its side in the short term, decreasing incentives to maintain peaceful coexistence between the PRC and Taipei. The data in the table above could be a preview of how alignments in the region could develop in the 2020s.

At the same time, China has developed various measures to influence Taiwan, including economic pressure, public opinion and media warfare, psychological warfare, and legal warfare.<sup>6</sup> While

---

<sup>6</sup> For more discussion on China’s political warfare and the “Three Warfares” concept, see: Kerry K. Gershaneck, “To Win Without Fighting: Defining China’s Political Warfare,” *Marine Corps University Press*, June 2020,

many observers believe that an across-the-beach invasion is not imminent, Beijing is moving forward in other ways to eventually gain control of Taiwan.

### All Means Short of War

“China’s objective is not to conquer, but to intimidate and negotiate a favorable agreement,” says Chas Freeman, a former senior American diplomat. “However, there is probably no peaceful path forward” on the question of Taiwanese independence because of intractable differences between Beijing, Washington, and Taipei.<sup>7</sup>

Linda Jakobson, an expert on the PRC’s foreign and security policy and the founding director of the Australian policy institute China Matters, argues that a likely scenario entails the step-by-step coercion of Taiwan – the use of “all means short of war” to destabilize Taiwan society and force it to accept unification talks. But she cautions that the situation is unstable. “The pivotal reason that peace (across the Taiwan Straits) has endured for 70 years has disappeared. Unlike his predecessors, Xi Jinping...is no longer prepared to leave unification of the mainland and Taiwan to future generations,” Jakobson writes ([China Matters](#), February 2021). The military balance of power has shifted in Beijing’s favor following increased spending on hardware, in particular, short- and medium-range ballistic missiles that could threaten American bases in Guam and Okinawa and deny regional access to the U.S. Navy ([The Diplomat](#), November 17, 2020).<sup>8</sup>

Hence China’s likely appeal to Taiwan: join the People’s Republic and return to the motherland. Preserve stability. Avoid warfare, invasion, and Yemen-like devastation of society. While the chances of a Normandy-style, across-the-beach invasion within the next few years are not seriously considered by a wide spectrum of observers, the PLA ground forces, navy (PLAN) and air force (PLAAF) are more ready than before to initiate hostile action in the waters around Taiwan. This new confidence has been demonstrated by increased military drills—including live-fire exercises and frequent incursions into Taiwan’s air defense identification zone (ADIZ)—in China’s southeastern Fujian Province and near the Taiwan Strait ([Global Taiwan Brief](#), October 7, 2020; [The Diplomat](#), October 20, 2020).

*The chances of a Normandy-style, across-the-beach invasion within the next few years are not seriously considered...but the PLA ground forces, navy and air force are more ready than before to initiate hostile action in the waters around Taiwan.*

<https://www.usmcu.edu/Outreach/Marine-Corps-University-Press/Expeditions-with-MCUP-digital-journal/To-Win-without-Fighting/>; Peter Mattis, “China’s ‘Three Warfares’ in Perspective,” *War on the Rocks*, January 30, 2018, <https://warontherocks.com/2018/01/chinas-three-warfares-perspective/>.

<sup>7</sup> Author’s interview with Chas Freeman, February 20, 2021.

<sup>8</sup> For discussion on developments in Chinese Antiaccess/Area Denial (A2/AD) capabilities in the Western Pacific, see: Stephen Biddle and Ivan Oelrich, “Future Warfare in the Western Pacific: Chinese Antiaccess/Area Denial, U.S. AirSea Battle, and Command of the Commons in East Asia,” *International Security*, Vol. 41, No. 1 (Summer 2016), p. 7-48, [http://www.mitpressjournals.org/doi/pdf/10.1162/ISEC\\_a\\_00249](http://www.mitpressjournals.org/doi/pdf/10.1162/ISEC_a_00249).

While China is not likely to contemplate an actual across-the-beach invasion and an accompanying bombardment of Taiwan in the near term, it has instead engaged in a persistent and pervasive form of “gray zone” warfare ([Reuters](#), December 10, 2020), which seeks to intimidate and wear down a foe without provoking a conventional military response. To this end, Beijing has pursued a long-term intimidation campaign against Taiwan’s population, with its lobbing of missiles near the island during the third Taiwan Strait Crisis (July 1995 to March 1996) serving as one historic example of measures “short of war” ([The National Interest](#), March 10, 2017).

In September 2020, PRC Foreign Ministry spokesperson Wang Wenbin (王文斌) stated, “The Taiwan region is an inalienable part of China’s territory. The so-called “median line” [of the Taiwan Strait] is non-existent,” laying down a justification for increasing PLAAF incursions into Taiwan’s ADIZ ([PRC Foreign Ministry](#), September 21, 2020). This provoked fears that Beijing was entering a new phase of increasingly belligerent behavior towards Taiwan, as mainland promises of “peaceful reunification” wear increasingly thin and hawkish voices within the PRC increasingly assert that “only force can ‘resolve’ the Taiwan ‘issue’ once and for all” ([The National Interest](#), September 22, 2020).

Following a brief incident in 1999, Chinese aircraft did not cross the median line of the Taiwan Strait until March 2019. By October 7, 2020, Taiwan reported that China had crossed the median line 49 times, and the PLAAF has stepped up the frequency, scale and complexity of its incursions in 2021 as the U.S. has continued deepening ties with Taipei ([ROC Overseas Community Affairs Council](#), October 8, 2020; [Reuters](#), April 12). In response, the Taiwanese Ministry of National Defense began issuing public notices on the PLA’s incursions into Taiwanese airspace in September 2020 ([Global Taiwan Brief](#), April 7).

If Chinese leaders decide that the time for persuasion has ended, they are likely to first make intermediate moves against Taiwan’s outlying island possessions in a test of PLA capabilities and of the resolve of their opponents in Taipei and Washington. “They can inflict a lot of pain without an invasion,” says Dennis Blasko, a former U.S. military attaché to Beijing and an independent analyst on the Chinese military.<sup>9</sup>

Blasko believes that the senior PLA leadership would prefer to have more time to modernize equipment and train their personnel and units to develop the sort of combined operations in the air, on land, and at sea necessary to assault a hard target like Taiwan. But if ordered to pull the trigger, Chinese forces still have many options short of a direct invasion to apply pressure. These include a range of cyber and information operations to disrupt life in Taiwan (and perhaps in countries friendly with the island); increased air and sea deployments around Taiwan to cut trade and restrict travel; the creation of sea and air exclusion zones for PLA live-fire exercises and weapons demonstrations; and raising the alert level of units stationed along all of China’s borders and the movement of out-of-area forces into the region, including civilian assets, to augment PLA capabilities near Taiwan.

---

<sup>9</sup> Author’s interview with Dennis Blasko, January 31, 2021.

PLA theater commanders have certainly developed an array of long-range strike options at selected high-value targets on Taiwan to demonstrate the kind of destruction that may ensue if Taiwan's leaders do not come to the negotiating table. Blasko adds that a number of steps would presage a blockade or an invasion. "They might use special operations forces to make their presence and capabilities known" on Taiwan, or mount operations against Taiwan's outlying islands like the Penghu and Pratas (Dongsha) Islands" (see map below). But he adds that all these actions would result in the loss of strategic surprise for and allow the U.S. to assess the situation and deploy additional forces into the region in response.<sup>10</sup>

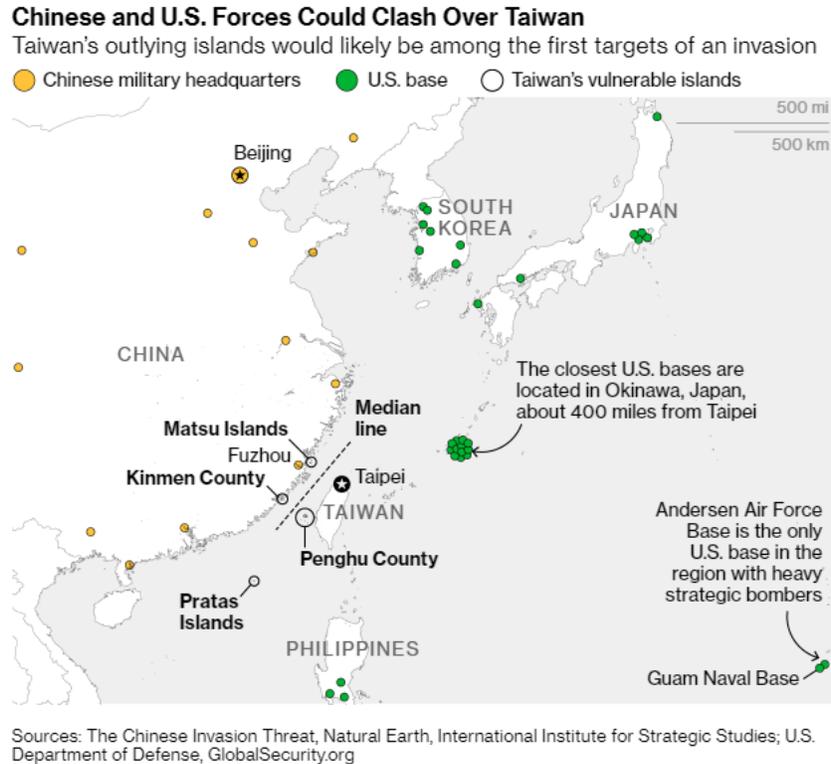


Figure 2. Source: [Bloomberg](#).

While such measures would be less likely than a full-scale invasion to prompt a violent response from Washington, they could still damage morale on Taiwan and promote a sense of inevitable defeat. If China's leaders eventually see outright invasion as a viable option, what do current strategy, doctrine, and CCP history tell us about how, and when, such operations would be conducted?

### Invader Agonistes

As noted above, "recovering" Taiwan has been crucial to PRC leaders since the nation's founding in 1949. But the U.S. has historically stood between China and this goal.

<sup>10</sup> Ibid.

## *Pesky Americans*

During the early part of the Qing Dynasty (1644-1911), China's rulers "passively" administered the island in order to avoid stimulating potential resistance. After Japan defeated China in the 1894-1895 Sino-Japanese War, Tokyo seized Taiwan as a colony.<sup>11</sup> By this point, the island's geo-strategic importance in an era of great power naval competition was clear. A 1944 U.S. Navy report observed that Taiwan "dominates the China coast and all coastwise shipping between Japan and Southeastern Asia. Japanese officials refer to it as 'the nation's great plane carrier in the south.'"

This observation was recalled in a 1969 study by Chas Freeman, the retired former diplomat who served as a translator during Nixon's historic 1972 visit to China. "In unfriendly hands Formosa (Taiwan) and the Pescadores would seriously dislocate the existing, even if unstable, balance of moral, economic, and military forces upon which the peace of the Pacific depends. It would create a breach in the island chain of the Western Pacific that constitutes for the United States and other free nations the geographical backbone of their security structure in that ocean...on strategic grounds alone the United States has a substantial interest in the maintenance of a friendly Taiwan, free from the control of the mainland communist regime," Freeman wrote ([Chasfreeman.net](http://Chasfreeman.net), accessed April 15).

Ian Easton, Senior Director of the Project 2049 institute and the author of a thorough 2017 study of how a Normandy-style PLA invasion of Taiwan might actually be pursued, notes that a significant part of the PLA's budget is dedicated to preparing for a takeover of Taiwan and fighting off the Americans should they come to the rescue. Once the CCP's old enemy on Taiwan is extinguished, "China could shift energy and resources to project power globally."<sup>12</sup>

In their own way, the CCP might agree with such assessments. In 1949, the party viewed taking Taiwan as the "last campaign to end China's civil war" that would erase the century's political division and political turmoil, writes Chen Jian, professor at New York University and an authority on China in the Cold War. That year, Mao Zedong asserted that "If we failed to solve the Taiwan problem in a short period, the safety of Shanghai and other coastal ports would be severely threatened."<sup>13</sup>

Indeed, after the Kuomintang (KMT) Nationalist Party retreated to Taiwan, KMT air force raids on Shanghai and other coastal targets were a serious issue during the early years of the PRC, and

---

<sup>11</sup> Ruiping Ye, "The Colonization and Settlement of Taiwan, 1684-1945: Land Tenure, Law, and Qing and Japanese Policies," *Routledge Studies in the Modern History of Asia*, August 2018, accessed April 15, 2021, [https://www.researchgate.net/publication/327815356\\_The\\_Colonisation\\_and\\_Settlement\\_of\\_Taiwan\\_1684-1945\\_Land\\_Tenure\\_Law\\_and\\_Qing\\_and\\_Japanese\\_Policies](https://www.researchgate.net/publication/327815356_The_Colonisation_and_Settlement_of_Taiwan_1684-1945_Land_Tenure_Law_and_Qing_and_Japanese_Policies).

<sup>12</sup> Author's interview with Ian Easton, January 27, 2021. See also: Ian Easton, *The China Invasion Threat: Taiwan's Defense and American Strategy in Asia* (Arlington: Project 2049 Institute, 2017).

<sup>13</sup> Jian Chen, *China's Road to the Korean War: The Making of the Sino-American Confrontation* (New York: Columbia University Press, 1994), 96-97. Xiaoyuan Liu, *To the End of Revolution: The Chinese Communist Party and Tibet, 1949-1959* (New York: Columbia University Press, 2020), 29.

Beijing's fear of a threat from Taiwan during this period were not unfounded ([Chinanews.com](http://Chinanews.com), March 5, 2014). Mainland Chinese historians have characterized the period between the founding of the PRC on October 1, 1949 and the invasion of North on June 25, 1950 as a lost opportunity to seize Taiwan without American interference ([Sichuan News Network](http://Sichuan News Network), July 2, 2004).

*“In the event of war between the United States and the USSR, Formosa’s value to the communists is the equivalent of an unsinkable aircraft carrier and submarine tender ideally located.”*

But the Americans were already debating the importance of Taiwan. In 1950, General Douglas MacArthur wrote two memorandums to the Pentagon on May 29 and June 14, urging U.S. support for Taipei. He argued that “in the event of war between the United States and the USSR, Formosa’s (Taiwan’s) value to the communists is the equivalent of an unsinkable aircraft carrier and submarine tender ideally located” to counter U.S. forces in the region.<sup>14</sup> These memoranda and the advent of the Korean War underlined the importance of the “first island chain” as a barrier to China’s projection of military power into the open Pacific. On the other hand, in the hands of a foreign force, Taiwan serves as an unsinkable aircraft carrier to launch strikes on mainland China.

In the wake of the CCP’s victory on the mainland, America initiated efforts to infiltrate China, first in its east and northeast, and later, Tibet, using Taiwan as a base of training and operations for these efforts and for U-2 overflights.<sup>15</sup> Following the Sino-Soviet split a decade later, Russia also became an invasion threat to China. Beijing was consequently distracted from its plans to invade Taiwan for roughly 50 years, as political leaders and the PLA focused on homeland defense. But keeping in mind the KMT’s close ties to the U.S. and its continuing competition with the CCP as the legitimate government of China, Beijing never stopped thinking of Taiwan as a nearby threat.

The U.S.-led NATO bombing of Yugoslavia in 1999 led Chinese strategists to more seriously consider the realities of taking Taiwan by force. Even in the early spring of that year, before the U.S. bombed the Chinese Embassy, Belgrade on May 7, the air war in Kosovo suggested to many Chinese military thinkers that Washington would be willing to intervene in a conflict over Taiwan. M. Taylor Fravel, a professor of Political Science at the Massachusetts Institute of Technology, describes Beijing’s strategic shift toward the offense. “China needed to prepare to resist a ‘strong adversary.’ In this way, the air war in Kosovo had a greater impact on the PLA’s threat perceptions than the 1995-96 Taiwan Straits crisis.”<sup>16</sup>

In his book *Active Defense: China’s Military Strategy Since 1949*, Fravel cites a March 2000 PLA National Defense University assessment of the air war in Kosovo, where the authors concluded

---

<sup>14</sup> Chen, *China’s Road to the Korean War*, 118-119.

<sup>15</sup> Frank Holober, *Raiders of the China Coast: CIA Covert Operations During the Korean War* (Annapolis: Naval Institute Press, 1999); Tsering Shakya, *The Dragon in the Land of Snows: A History of Modern Tibet Since 1947* (New York: Columbia University Press, 1999), 170-172; “CIA Secrets Documentary – Extraordinary Fidelity,” Youtube, March 4, 2017, <https://www.youtube.com/watch?v=-0Ow8INeo4>; “CIA Secrets Documentary – The Shadow Circus The CIA in Tibet,” Youtube, March 6, 2017, <https://www.youtube.com/watch?v=7VigZLLzGQU>.

<sup>16</sup> M. Taylor Fravel, *Active Defense: China’s Military Strategy since 1949* (Princeton: Princeton University Press, 2019), 223.

that a ground invasion of China was unlikely but that foreign airstrikes against China were a higher risk.<sup>17</sup> In correspondence with the author, Fravel adds, “I think the Iraq War (2003) affirmed what the PLA had concluded in the Kosovo War but on a wider scale.”<sup>18</sup>

That quick American defeat of Iraqi forces was closely watched by Chinese military institutes. Among the lessons learned: the use of information technology on the battlefield—dubbed “informatization” in Chinese (信息化, *xinxi hua*)—made possible the lethal use of precision-guided munitions (“smart bombs”) and enabled better coordination of joint operations. They concluded that informatization was just as important to victory as air superiority, neither of which the PLA had achieved against Taiwan and the U.S. at that time.<sup>19</sup>

After this realization, PRC Five-Year Plan (FYP) goals included specific milestones related to preparation for the invasion, says Lonnie Henley, a West Point graduate and a recently retired former Defense Intelligence Officer for East Asia at the U.S. Defense Intelligence Agency. Henley says that goals for minimal readiness to invade Taiwan were probably achieved in the 13<sup>th</sup> FYP, which ended in 2020, and that the next two plans (ending in 2025 and 2030) may aim to further strengthen important capabilities such as amphibious lift and airlift.<sup>20</sup> But other critical shortcomings remain.

### *Joint Operation Pains*

“The gap between American and Chinese forces will be narrowing over the next few years,” says Nigel Inkster, the former MI-6 operations chief. “Xi Jinping has made it clear that the PLA must be ready to undertake this mission. The PLA services (army, navy, and air force) have improved: they can fly by day and night, are looking at joint operations, and are developing amphibious assault capabilities.” Inkster goes on, “However, my sense is that they don’t feel they’re ready yet,” with China’s current approaches being “too formulaic [and] too safety-focused.” Additionally, under the PLA’s heavily centralized and top-down organizational structure junior ranks “don’t have the ability to improvise.”<sup>21</sup>

*“Xi Jinping has made it clear that the PLA must be ready to undertake this mission. The PLA army, navy and air force have all improved: they can fly by day and night, are looking at joint operations and are developing amphibious assault capabilities.”*

Dennis Blasko, the former U.S. military attaché in China, recently cited a large body of evidence in testimony before the U.S.–China Economic and Security Review Commission indicating that the PLA recognizes significant shortcomings in its capabilities to conduct sustained advanced military

<sup>17</sup> Fravel, *Active Defense*, 222-226.

<sup>18</sup> Author’s emails with M. Taylor Fravel, February 19, 2021.

<sup>19</sup> Fravel, *Active Defense*, 223.

<sup>20</sup> Author’s interview with Lonnie Henley, February 9, 2021.

<sup>21</sup> Author’s interview with Nigel Inkster, February 26, 2021.

operations, especially as it operates further away from China and beyond the first island chain ([USCC](#), February 7, 2019).

In a later interview with the author, Blasko cites additional evidence including a February 2021 *PLA Daily* article quoting the results of a meeting on naval operations held by the PLA Navy's submarine training center, in which the participants claimed that "research into maritime tactics aren't deep and lack [insight into] methods of tactical command." The same article also found that the PLA Navy was overly risk-averse and that "battlefield training gives much consideration to safety, but gives little consideration to the enemy situation" ([PLA Daily](#), February 4, 2021).

Blasko argues, "I have seen this type of self-criticism by members of the PLA of their capabilities for over a decade and have hundreds of similar examples relating to leadership, training, logistics, equipment, and other shortcomings... I believe the PLA leadership is cautious about initiating combat unless forced to respond to actions that cross any of a number of red lines threatening China's sovereignty and territorial claims. But if pressed, they likely will come up with responses that surprise us and undertake actions we do not expect."<sup>22</sup>

Lonnie Henley, the former Defense Intelligence Officer for East Asia, has an idea of what one of those surprises might entail. He believes that the PLA is confident that it can presently supplement military lift with mobilized civilian assets, organized under the Chinese People's Armed Forces Maritime Militia (PAFMM). This force has recently attracted attention for its role organizing fishing boats to defend Beijing's claims in the South China Sea and the Senkakus, as described by Andrew Erickson of the Naval War College ([Andrewerickson.com](#), April 29, 2019).

Equally important, however, is its role as China's merchant marine force, crewing commercial ships mobilized to support large-scale PLA power projection operations, explicitly including any assault on Taiwan, according to Henley.<sup>23</sup>

### *The Fervor Gap and Its Dangers*

One thing that may carry the PLA closer to invasion would be enthusiasm for victory and disdain for the consequences of failure. Chas Freeman, the retired American diplomat, says that Beijing sees "taking Taiwan as vital to state security and the future of the party—in contrast to Washington, where the security of Taiwan is important but not existential." He calls this gap the balance of fervor. "The more we build up in Taiwan, the more China builds for invasion and the more nationalist fervor is generated on the mainland."<sup>24</sup>

The fervor factor is also acknowledged by Lonnie Henley, the former Defense Intelligence Officer for East Asia. Henley said in an interview and in recent testimony that even if Taiwan and the U.S. pushed a Chinese invasion back into the sea—and destroyed the Chinese navy and air force in the process—Beijing cannot afford to accept defeat at the hands of the U.S. They would continue to fight by maintaining an air and sea blockade ([USCC](#), February 18).

---

<sup>22</sup> Author's interview with Dennis Blasko, January 31, 2021.

<sup>23</sup> Author's interview with Lonnie Henley, February 9, 2021.

<sup>24</sup> Author's interview with Chas Freeman, February 20, 2021.

Defeating such a blockade would be difficult unless American forces destroyed China's integrated air defense system. So long as that network remains intact, short-range systems such as anti-ship cruise missiles, artillery rocket launchers, torpedo boats, patrol craft, mines, and third-generation fighter jets would leave China enough power to enforce the blockade. In other words, to protect American warships in the western Pacific and win a war over Taiwan, the U.S. might need to bomb the Chinese mainland.

That is the biggest fear of Chulalongkorn University's Professor Busbarat: "A U.S. attack against PLA bases on the mainland would likely trigger nuclear retaliation by Beijing. It won't be like attacking those small or failed states as the U.S. had done before."<sup>25</sup>

Charles Parton, a former UK Foreign Office official and now fellow at the Royal United Services Institute, adds a blunt observation. "China is after all a nuclear power. Why are we so prepared to talk about war with China when we don't tend to talk about a war with Russia?"<sup>26</sup>

### **Is Time on Nobody's Side?**

The Chinese Communist Party "has never in its history been more strong, more powerful, [or] had as many resources at its disposal [and presently has) a larger degree of support than we previously thought," said Jude Blanchette of the Center for Strategic and International Studies in Washington. ([Sinica Podcast](#), March 4 (10:10)).

At the same time, Beijing may be troubled by a sense of urgency for several reasons, propelling it toward short-term action. "We could be witnessing 'peak China' right now," Toshi Yoshihara argues. A "downward slope in the 2030s" may be imminent because of looming demographic problems that could reduce military recruitment, a hidden debt fiscal crunch impacting military spending and a growing urban-rural divide that could affect internal security.

Sulmaan Wasif Khan has written that "the PRC's security environment is becoming more dangerous" because of the increased military spending of China's neighbors. That could prompt even greater outlays by China and the possibility of "imperial overstretch" when the burden of security on the economy becomes too great to bear.<sup>27</sup> Elsewhere, Khan notes that "this will not necessarily entail a collapse in Chinese power, but it does cause that power to be diminished. The functioning of the state will suffer, and in China, that always raises existential fears."([Sinica Podcast](#), May 16, 2019).

If the 2030s could be a crunch time for Beijing, the 2040s could be worse still for political reasons. Should the Taiwan "issue" remain unresolved by the time of the PRC's centennial in 2049, it could generate a political crisis for the CCP. Party leaders would have to admit that they still had failed to complete the "last campaign to end China's civil war" a full century after the 1949 victory. Xi Jinping has explicitly framed reunification as a requirement for achieving his "China Dream" of national rejuvenation by 2049 ([Xinhua](#), January 2, 2019; [Brookings Institution](#), March 30). It is

---

<sup>25</sup> Author's interview with Pongphisoot (Paul) Busbarat, February 26, 2021.

<sup>26</sup> Author's interview with Charles Parton, February 27, 2021.

<sup>27</sup> Sulmaan Wasif Khan, *Haunted by Chaos: China's Grand Strategy from Mao Zedong to Xi Jinping* (Cambridge: Harvard University Press, 2018), 233-234.

also easy to find statements in China’s CCP-approved media such as “By 2049, no matter what happens, China must achieve the goal of unifying with Taiwan!” ([Sohu](#), November 20, 2017)<sup>28</sup> and, “The complete reunification of the country is an important part of the great rejuvenation of the Chinese nation, and 2049 is that point in time” ([Hawaii Online](#), January 11, 2018).<sup>29</sup>

Nonetheless, China now appears to possess a “minimal readiness” to invade Taiwan, supported by hundreds if not thousands of short-range ballistic missiles which could destroy urban life on the island—and a cyber warfare capability that could stop modern society in its tracks. If the PLA’s military lift capacity grows in the 2020s, time may run out for Taipei and Washington before it does for Beijing, even if China chooses “all means short of war” over invasion.

This is where Taiwan encounters the “fervor gap” problem and the will to fight becomes entangled in questions of defense priorities as Taiwan prepares for a lopsided military contest.

Lonnie Henley, the former DIA analyst, opined in the interview cited above that it is impossible to measure in advance the will of Taiwan’s military and population to resist an invasion by the mainland. He noted that the Taiwan Ministry of National Defense (MND) has prioritized vulnerable big-ticket items such as M-1 Abrams tanks that are ill-suited for Taiwan’s defensive needs and ignored the need for additional stockpiles of weapons and ammunition to resist the PLA if they establish beachheads and move inland.

This argument has gone on for some time behind the scenes in Washington and Taipei. Bonnie Glaser, Director of the Asia Program at the German Marshall Fund of the United States, said in an interview that “the Taiwan military thinks that the most important mission is to prevent an amphibious landing. But the US response for years has been what’s your plan B” if hostile troops establish a presence on Taiwan? “How do you convince people that they need to fight, and maintain a viable reserve force? Conscripted has been down to four months for several years and it’s laughable. To revamp the reserves, Taiwan would need to use Ministry of National Defense resources and the ministry is not willing to give up anything. We need metrics about how you really measure will to fight. My sense is that most of the people in Taiwan just don’t take the threat seriously. It’s also a cultural problem. KMT families dominated the military for so long and the military itself isn’t highly regarded as a career.”

The independent analyst Tanner Greer, who has written about Taiwan’s defense capabilities for several years, has given an even more pessimistic assessment of the willingness of Taiwan’s people to defend themselves. “Fundamentally, there’s a lack of willingness to make sacrifices for the sake of national defense. The Taiwanese people are extremely defeatist. They don’t necessarily believe they can win. The training of conscripts is very poor. Reservists on paper are not real. The political leadership hasn’t had the courage to ask the Taiwanese people to change it.” Still, he notes, “Taiwan is supremely defendable if they want to. They can save themselves, but they have to be willing to do real national service, not four-month fake stuff where they don’t even really learn how to shoot a gun.” ([ChinaTalk](#), August 21, 2020).

---

<sup>28</sup> Original text: “到了 2049 年，无论发生怎样的情况，中国都必须实现统一台湾的目标!”

<sup>29</sup> Original text: “国家的完全统一，是中华民族伟大复兴的重要组成部分，2049 年就是一个时间节点。”

“Taiwanese, all by themselves, must accept the fact they will have to get waist deep in the primordial ooze to defeat an invasion,” writes Wendell Minnick, a longtime observer of the Taiwan defense scene. “The United States must begin a tough in-your-face dialogue with both political parties on pragmatic boots-on-the-ground issues before time runs out.” ([The National Interest](#), March 19, 2019)

Regardless, if Beijing sees Taiwan as moving toward independence, or if the U.S. again stationed forces on the island, the CCP could become unpredictable because “we are not sure of the place of Taiwan in Chinese politics. It is a black box” says Glaser. “Taiwan's armed forces "won't last very long. They would acquiesce very quickly if China went for an all-out invasion (because) the military balance has changed," adds the former commander of the U.S. Seventh Fleet, Admiral Robert L. Thomas, Jr., now at the University of California San Diego. “The best that the ROC(T) military can hope for is bad weather, fog and friction, to slow down the inevitable.” But “the PRC does not need to go all in - their readiness exhaustion campaign is working well in East Asia and the U.S. (and its) allies do not have a good answer.”<sup>30</sup>

The situation seems to leave only a narrow window in the early 2020s to preserve both peace and Taiwan’s freedoms, before Beijing further increases its capability to invade Taiwan and at the same time starts feeling more pressurized to solve the problem once and for all.

### **The Taiwan Computer Chip Conundrum**

We have so far considered several possible consequences if Taiwan fell to Beijing, including:

- The geopolitical advantage that China would gain by breaking the first island chain and securing uninterrupted access to the Pacific.
- The advantages China would gain over Japan by reducing Tokyo’s security on its southern flank.
- And the removal of Beijing’s old foe, the ROC, from its coastline, bringing the Chinese revolution to a close and establishing the PRC as the sole legitimate Chinese state.

However, still to explore is Taiwan’s crucial production of computer chips, aka: integrated circuits, or semiconductors. Taiwan’s critical role in the global semiconductor supply chain makes it extremely important to worldwide industry, and an even juicier prize for Beijing.

#### *Semicon 101—and Taiwan’s Crucial Position*

Semiconductors are the axiom of the microelectronics revolution that has spawned almost all modern technology. With their ultra-miniaturized circuitry, semiconductors place more computing power in your pocket with a mobile phone than was in a Cray supercomputer in the early 1990s. They are the heart of all electronic devices, and power telecommunications systems; industrial controllers and manufacturing equipment; automobile systems, aircraft avionics and advanced

---

<sup>30</sup> “Security Opportunities and Challenges in the Taiwan Strait” [webinar](#), April 27, and follow-on interviews the same day with Dr. Glaser and Admiral Thomas.

weaponry systems. They enable the “internet of things” and the internet itself. They are everywhere necessary, and necessarily everywhere.

Semiconductors are manufactured in two basic steps. First, they are formed through processes such as photolithography and chemical etching, which place tiny circuitry onto a thin silicon wafer that looks like a round mirror—typically eight to 12 inches, or 200-300 mm, in diameter ([Tom’s Hardware](#), April 25, 2007; [Applied Materials](#), accessed April 15; [Wafer Pro](#), May 28, 2017). When completed, a chip wafer looks like a round chessboard—and contains hundreds of integrated circuits.

These processes are carried out in a fabrication line, or “fab.” The etched circuits in advanced devices measure less than 10 nanometers, or one 100 millionth of a meter, when fashioned onto the surface of the silicon, and the capability to produce them to cutting-edge standards is held by a handful of companies worldwide.

The second step of semiconductor production is accomplished in an assembly and test facility, where the wafer is “diced” into individual chips with a precision instrument called a wafer saw. Each chip is then placed in a plastic package that can be attached to a circuit board. This finished product is sold to a downstream manufacturer to be mounted in the device it will power. Individual chip designs serve distinct functions. They can become the central processing unit (CPU) or brains of device; store computer memory; serve as vital transistor circuits in complex machines; or be integrated into microwave devices, industrial controls, auto systems, sensors, and dozens of other applications ([Toshiba](#), accessed April 15)

Although the U.S. accounts for nearly half of global semiconductor sales, its share of global semiconductor *manufacturing* has dropped from 37 percent in 1990 to 12 percent in February 2021 ([The Diplomat](#), February 27, 2021). This is because it is cheaper for U.S. companies—which still lead in semiconductor IP and research and development—to contract out fabrication than it is to build onshore plants, which typically cost billions of dollars. As a result, Taiwan companies with chip-making fabs, also known as foundries, command 63 percent of the worldwide market revenue in the chip business ([CNBC](#), March 15).

While most chips are designed elsewhere, they are made by Taiwan firms. Companies like Nvidia, AMD, Qualcomm, and Mediatek may design their own chips, but they have gone “fabless”—some or all of their inventory is produced by companies like Taiwan Semiconductor Manufacturing Corporation (TSMC), which is the world’s top foundry, and United Microelectronics Corporation (UMC) ([Trendforce](#), February 24). Both companies are headquartered in Hsinchu, Taiwan, where TSMC has six out of its nine fabs, including all of its most advanced production at the smallest lithographies.<sup>31</sup> These two firms alone command 41 percent of worldwide semiconductor manufacturing capacity and 63 percent of revenue ([Counterpoint Research](#), February 2).

---

<sup>31</sup> The author contacted TSMC to learn what percentage of their production comes from Taiwan, but they prefer to keep that data proprietary. However, their [website shows](#) that the most advanced production appears to be done at their four 12-inch wafer “GIGAFABs” in Taiwan. TSMC also has four 8-inch wafer fabs and one 6-inch wafer fab in Taiwan; one 12-inch fab in Nanjing, China; and two 8-inch wafer fabs, one in the U.S. and one in China. An advanced 5nm fab, now under construction in [Arizona](#), will be operational in 2024.

Ranking	Company	Headquarters	1Q21E (million USD)	1Q20 (million USD)	Market Share
1	TSMC	Taiwan	12,910	10,310	56%
2	Samsung	South Korea	4,052	3,660	18%
3	UMC	Taiwan	1,603	1,402	7%
4	Global Foundries	U.S.	1,469	1,355	7%
5	SMIC	China	1,059	905	5%
6	Tower	Israel	345	300	2%
7	Powerchip (PSMC)	Taiwan	340	283	2%
8	Vanguard (VIS)	Taiwan	327	260	1%
9	Hua Hong	China	288	203	1%
10	DB HiTek	South Korea	197	189	1%

Table 2: Global Revenue Share of Top Ten Semiconductor Foundries. Source: [Trendforce](#).

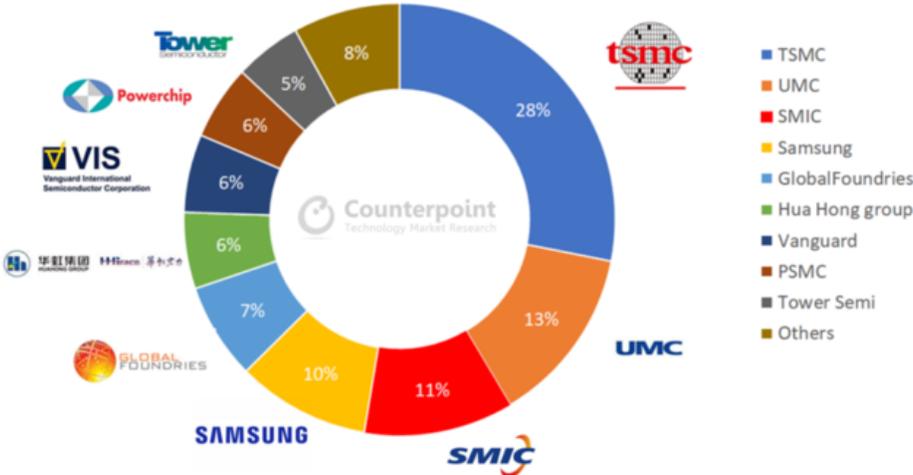


Figure 3: Global market share of major semiconductor companies as measured by manufacturing capability. Source: [Counterpoint Research](#).

Along with TSMC and Samsung, the American company Intel is among the top three companies with its own fabs. Unlike TSMC and UMC, Intel is not just a foundry making chips for others. Like Samsung, Intel possesses the entire manufacturing process from start to finish. But Intel’s manufacturing capabilities are now secondary to TSMC’s. They no longer have TSMC’s capacity to manufacture the most cutting-edge semiconductors in commercial quantities, which now have circuit widths of only 5 nanometers (nm). Moreover, TSMC is forecasted to begin producing 3nm chips in 2022 at their new 19 billion dollar fab near Tainan, which reportedly will make 5nm and 3nm CPUs in 2022 for Intel ([ITHome](#), November 25, 2020; [Techpowerup](#), January 28; [Techradar](#), January 29).

*In the first quarter of 2021, three Taiwanese companies dominated 65 percent of global semiconductor market share, making the island an even juicier prize for Beijing, which has struggled to build out an indigenous semiconductor capability.*

China has always had trouble obtaining the semiconductor manufacturing equipment needed in a fab to fashion these ultra-small circuits onto the silicon ([CSET](#), March 2021). This is due to many reasons, including a lack of engineering know-how and talent. U.S. export controls also restrict the most advanced equipment and software from being shipped to China, further hindering the CCP leadership's strategic goals to gain an independent semiconductor manufacturing capacity. Chinese chip firms have had historic problems with low "success rates," and although their share of low-end chip production is rising, China's chip yield—that is, the number of wafers that pass quality control tests—has been comparatively low ([Wccftech.com](#), March 11). China's semiconductor national champion, the Semiconductor Manufacturing International Corporation (SMIC), is years behind its foreign competitors ([Asia](#)

[Times](#), January 18). In 2020, Chinese semiconductor manufacturers produced only six percent of the chips used by Chinese firms ([IC Insights](#), January 6), meaning that the PRC imported about 94% of the computer chips they needed that year.

In an interview last June with the industry magazine *Semi Engineering*, Leo Pang of the Japanese semiconductor design manufacturing equipment (SME) company Design 2 Silicon outlined other problems in China's indigenous semiconductor industry. "There are still many challenges for China, including the need for more talent and IP in semiconductor manufacturing, and the need to further narrow the gap in the leading process technologies" ([Semi Engineering](#), June 22, 2020). Pang added, "the top challenge is the tension between the U.S. and Chinese governments, which is causing uncertainty in the supply of manufacturing equipment and EDA [electronic design automation] software."

EDA is used for chip design and verification, micro-mechanical manufacturing, and other functions. Because of its historic difficulties with developing domestic semiconductor talent, the PRC has sometimes overtly sought to poach talent from nearby Taiwan. This was illustrated most recently in March when Taiwanese authorities raided the local offices of Bitmain, a PRC firm accused of illegally hiring local engineers to work on the mainland ([Bloomberg](#), March 9). To summarize, China is far from self-reliant in this space and, although it is striving to develop additional capacity, it will not overtake multinational chipmakers anytime soon.

### *War and Peace and Semiconductors*

But what if Beijing controlled Taiwan, with its huge chip manufacturing capacity and personnel who did not manage to depart? Could TSMC's fab capacity be successfully turned over to SMIC?

A December 2019 estimate indicates that as many as 3,000 chip experts have already migrated to the Chinese mainland from Taiwan and other overseas locations, lured by lucrative salaries ([ZD Net](#), December 5, 2019). Although this has been insufficient to overcome China's domestic chip

talent shortages, it could provide the PRC with the necessary personnel to restart Taiwan chip factories in the event of a hypothetical takeover.

But semiconductor manufacturing equipment is complicated and sensitive, and the circumstances of a Chinese takeover would be critical, according to several former executives for a major semiconductor manufacturer consulted for this report.

Last year's COVID-19 pandemic demonstrated this delicate balance, creating world-wide bottlenecks in the semiconductor supply chain that effected everything from automobile to computer manufacturing (*New York Times*, April 15). But last year's impact would be almost routine compared to the anticipated outcomes from war between the PRC and Taiwan. Any conflict would likely prompt a fab manager to shut down the plant. Under normal conditions, returning production to normal after a controlled shutdown without damage to the equipment can take one or two weeks, even if the shutdown lasts only a few days.

*In the event of invasion, unanticipated semiconductor plant shutdowns could lead to “production loss, a higher risk of gas leaks and injuries, delayed [equipment] setups, and a restart process that takes weeks or months.”*

Assuming the economic chaos and infrastructure damage that would accompany a hypothetical violent conflict, Taiwan's semiconductor fabs would probably shut down in an uncontrolled manner. A former materials executive for one major chip firm said that a shutdown could cause damage to manufacturing equipment (aka: tools) even without a bomb coming through the ceiling, “resulting in production loss, a higher risk

of gas leaks and injuries, delayed tool setups, and a restart process that takes weeks or months.”<sup>32</sup>

Another former senior semiconductor executive commented that an uncontrolled shutdown would likely force a plant manager to “throw out all the production and start over, so minimum two months of no output. If the equipment was damaged, which can happen...[it could take] a year or more to replace.”<sup>33</sup>

A third recently retired executive noted how things would work in a controlled shutdown lasting more than a few days. “I would expect to start up in 6 months assuming everything was left in a warm state. Warm state means no loss of purge gasses, no loss of temperature control in lithography and a core of experienced start-up personnel.” He added, “For a sudden power down, I would expect the duration could take up to two years driven by lithography tools...You will also see things like silane lines and tools using silane getting smoked which would need to be replaced. Some other specialty gas and chemical systems will be lost and need to be replaced.”<sup>34</sup>

Replacing semiconductor manufacturing equipment, chemicals, and gases might take a lot longer than a year if the U.S. and other sources in Europe were vexed by the takeover. One knowledgeable

<sup>32</sup> Author's anonymous interview with semiconductor industry executive 1, March 2021.

<sup>33</sup> Author's anonymous interview with semiconductor industry executive 2, March 2021.

<sup>34</sup> Author's anonymous interview with semiconductor industry executive 3, March 2021.

industry insider conversant with American export controls explained: “If the PRC took over TSMC they may get a near term benefit, however much of the tools, IP, and access to skilled engineers needed by TSMC to produce chips would be cut off by export controls. [The] PRC currently lacks a domestic supply chain for many of these tools as well as skilled engineers to compete in the near term.”<sup>35</sup>

## What Is To Be Done?

In the face of Beijing’s belligerence, this paper has advocated that Washington realize it has the primary responsibility to maintain peace with China over Taiwan and preserve the island’s freedoms. But this would be hard to accomplish unilaterally. America needs the help of its allies. Charles Parton, the former UK and EU diplomat, is not optimistic about U.S. – EU coordination on China, nor even about a united stand with its closest allies: “There would be a lot of rhetoric in support of Taiwan and the U.S., but not a lot of action. The UK may be more likely to assist but not European nations... If you look at the way the EU is acting in relation to China, then there would need to be a big shift in attitude to prompt actual action.”<sup>36</sup>

Speaking about Washington’s closest allies who share secret intelligence with each other, the “Five Eyes” (Australia, Canada, New Zealand, the UK, and the U.S.), Parton observes, “The Five Eyes tend to stick together, though less so New Zealand. But no one would want to go down the path to prompt greater tension with China which might lead to further incidents.”<sup>37</sup>

But Taiwan’s importance to regional security and to the worldwide semiconductor industry should be evident. One Washington observer who prefers anonymity said that “Taiwan a key area of the new cold war, as important if not more so than the Fulda Gap was in the previous cold war.”<sup>38</sup> Based upon the same line of thinking, Larry Diamond, of Stanford University’s Hoover Institute, has called a possible PRC takeover of Taiwan “an event in world history tantamount to the Nazis marching into Czechoslovakia” in 1939 (*The Stanford Daily*, February 7).

*Taiwan is a key area of the new cold war, as important if not more so than the Fulda Gap was in the previous cold war.*

This dark vision comparing China in 2021 to Nazi Germany in 1938 may seem extreme, but it is not an ideological dig. As described above, if China assumed control of Taiwan, it would expose Japan to strategic vulnerability from its south. When Germany marched into Czechoslovakia, Poland was exposed to Berlin’s war machine from the west and the south, which aided the subsequent invasion of Poland in September 1939. This is therefore not so much a comparison of Nazism to socialism with Chinese characteristics. It is more a recognition of two strategic situations which carry strands of similarity.

---

<sup>35</sup> Author’s anonymous interview with semiconductor industry executive 4, March 2021.

<sup>36</sup> Author’s interview with Charles Parton, February 27, 2021.

<sup>37</sup> Ibid.

<sup>38</sup> Author’s anonymous interview with a Washington D.C.-based non-governmental analyst, February 2021.

Placing the greatest possible emphasis on working harder to unite allies in the defense of Taiwan and prevent a devastating war has the potential to unite more than one side of the debate on China policy. A wide range of figures from the China studies and international relations communities endorsed a recent opinion piece, which wrote:

*A successful U.S. approach to China must focus on creating enduring coalitions with other countries in support of economic and security objectives. It must be based on a realistic appraisal of Chinese perceptions, interests, goals, and behavior; an accurate match of U.S. and allied resources with policy goals and interests; and a rededication of U.S. efforts to strengthen its own capacity to serve as a model for others.*

*Ultimately, the United States' interests are best served by restoring its ability to compete effectively in a changing world and by working alongside other nations and international organizations rather than by promoting a counterproductive effort to undermine and contain China's engagement with the world ([Washington Post](#), July 3, 2019).*

The time has come for Washington to redouble efforts to keep the peace between China and the U.S., in part by recognizing China's peaceful rise as legitimate, and by making clear to Beijing that aggression against Taiwan, or any other place in Asia, will not be tolerated by the U.S. and its allies. We cannot fail. The clock is ticking.